IDG.com

VIVE LA DIFFERENCE!

Our series on the Best Places to Work in IT continues, with the best employers for benefits and diversity hiring. Page 54

RISE OF THE CTO

Some CIOs are handing off technical oversight to CTOs. But splitting responsibilities between them isn't easy. Page 50

MISSION IMPOSSIBLE?

Not quite. A Secret Service unit nabs cybercriminals with help from corporate IT. Page 44

COMPUTERWORLD

THE NEWSPAPER FOR IT LEADERS • WWW.COMPUTERWORLD.COM

JUNE 19, 2000 • VOL. 34 • NO. 25 • $5 COPY



JAMIE O'NEILL, chief operations officer at Garden.com, uses personalization technology to offer customized Web content and e-mailed gardening tips tailored to each customer's regional climate

GETTING PERSONAL

COMPANIES ARE RACING TO GIVE THEIR WEB SITES PERSONALIZED content and to mine their gigabytes of clickstream data. There's plenty of technology available, Carol Sliwa reports, so IT managers must decide whether to trust off-the-shelf tools, build their own or just outsource the whole thing. But Kim S. Nash warns that, unless sites give visitors some control over their privacy, the technology will generate a backlash from consumers and regulators.

Special report begins on page 62.

IBM ASSURES USERS IT'S A JAVA REGULAR

But Sun denies IBM's assertion that it has a J2EE license; users look forward to resolution of issue

BY LEE COPELAND

In a bid to calm fears that it might not adhere to rival Sun Microsystems Inc.'s branded Java platform, IBM last week publicly claimed that it indeed licenses the platform and plans to adhere to it. Sun, however, continued to insist that IBM isn't a licensee.

IBM's proclamation doesn't change any of the Java tools or capabilities available to users, but if it's true, several users said, it reassures them that the company will adhere to the Sun specification and not embark on a separate Java course.

IBM now says that it is, and always has been, a Java 2 Enterprise Edition licensee. It's the first time the company has made such a pledge.

"We have contractual rights to all [of Sun's] Java extensions, so we were a J2EE licensee by default before anyone else," said Scott Hebner, director of e-business marketing at IBM.

Hebner said IBM has had legally binding, long-term rights to all Java platforms and standard extensions supported by Sun since 1995.

However, Sun officials denied those claims.

"IBM is not a licensee at this time," said Rick Saletta, prod-

Java Standards, page 101

AT A GLANCE

IBM and Java

IBM's case as o longtime Jova proponent:

- Has 4,000 developers working on Java projects and products
- Has 110 shipping products based on Java
- Claims it was the first Java licensee with broad contractual rights to Sun's Java development language and all extensions

DOJ GRILLS ONLINE MEAT EXCHANGE

Probe gratifies Minn. farmers, lawmakers

BY BRIAN SULLIVAN

The Department of Justice has initiated an investigatinn to determine whether a business-to-business exchange being set up by six of the nation's largest meat producers violates antitrust laws.

The exchange has been under fire from farmers and lawmakers in Minnesota since the companies announced their plans in April.

Minnesota state Rep. Doug Peterson last week said he was glad the DOJ had begun the prohe into what be has called the "OPEC nf meat."

"We hope they will be aggressive with their investigation as well," said Peterson, a Democrat from the western part nf the state.

"I think the Microsoft decisinn has given the DOJ the guts and the will to go forward," he added.

The DOJ has declined to comment on the investigation. But a farm advocacy group

Meat Exchange, page 16



BRIAN SULLIVAN

TYSON FOODS, whose Morrilton, Ark., plant is shown here, is party to a proposed B-to-B exchange being investigated by the DOJ

TECH CEOs MAY BE FORCED HOME

Even company leaders stuck in H-IB backlog

BY JULEKHA DASH

As the co-founder of a 2-month-old Internet company, Shajan John has the usual concerns: attracting venture capital, finding good employees, seeking buyers.

But he's also hoping his green card will come through so he can stay in this country long enough to see his company, RigRent.com Inc., succeed.

Without a green card by year's end, John will have to return to his native India before he exhausts the six-year limit on his H-1B visa.

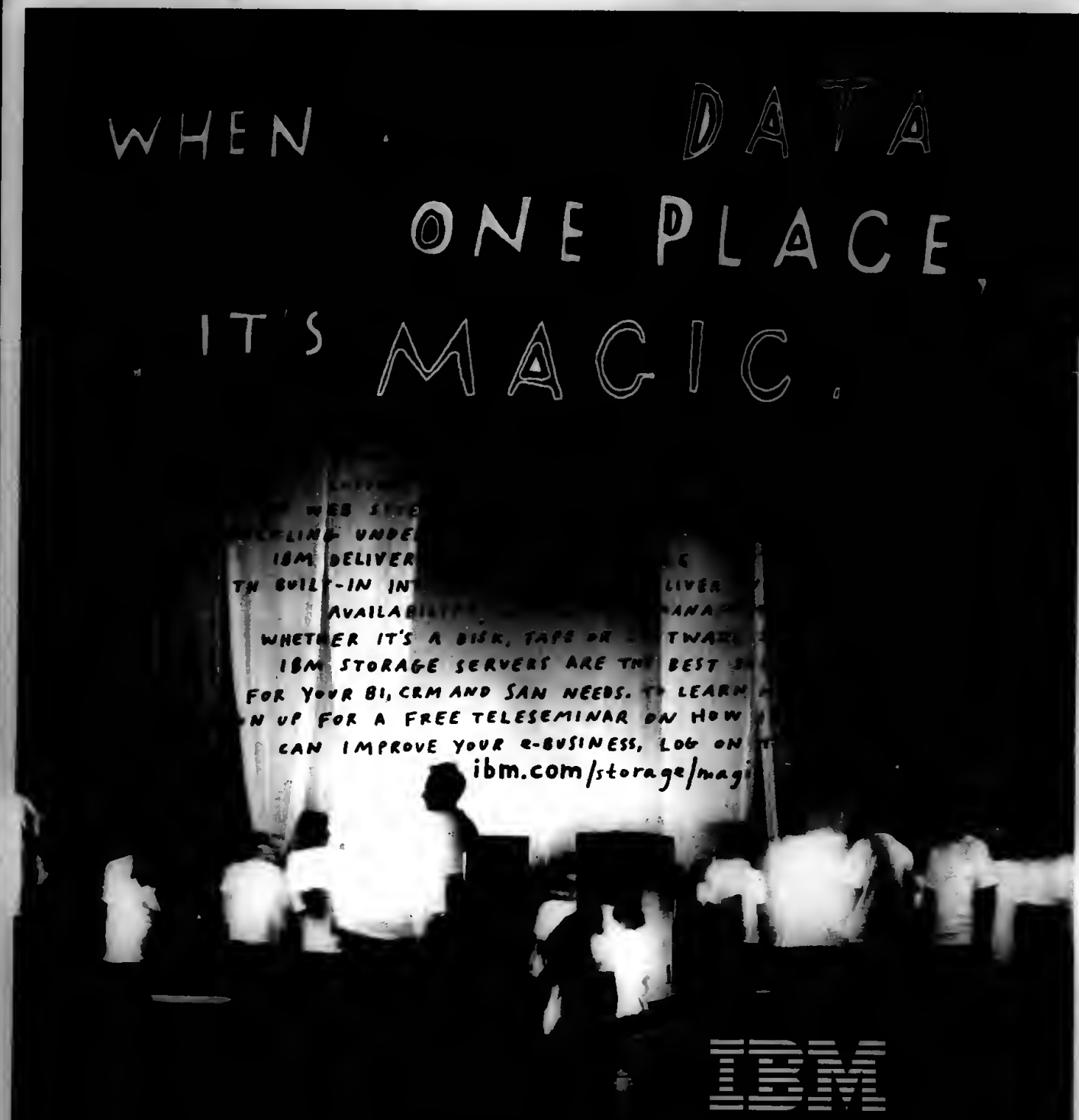
Increasingly, temporary visa holders are launching new ventures while facing the possibility of returning home due to delays in visa processing, a disruption that can be difficult for business, not to mention personal lives.

John, for instance, plans to expand his two-person staff to 30 if he attracts enough fund-

H-1B Visas, page 101

NEWSPAPER

UMI
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WHEN DATA
ONE PLACE,
IT'S MAGIC.
IBM
IBM business storage servers.
Technology Innovation Magic



GROWING PAINS

The nation's fastest-growing cities would seem to guarantee big job markets for IT professionals. Right? Not necessarily. Naples, Fla., is No. 5 in growth – but mostly with retirees. What other surprises wait in major growth markets? Page 89



ROBBIE MCCLARAN

EMERGING COMPANIES

DecisionPoint Applications Inc. CEO Marc Demarest (left) and Chief Technology Officer Larry Scheurich claim that their off-the-shelf data warehouse software can be up and running at a customer's site in eight weeks and at a fraction of the cost of a customized product. Page 86

COMPUTERWORLD THIS WEEK

JUNE 19, 2000

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4 **PROCTER & GAMBLE** goes online for a $100 million energy buy that analysts say is the biggest-ever electronic purchase.

6 **BANKS TARGET** paper checks for elimination, with systems that convert them to bits.

8 **LOS ALAMOS LOSS** highlights holes in effectiveness of even tight IT security policies.

10 **CROSS-BORDER** payment services seek to automate international trade for the first time.

12 **SAP PUSHES** mySAP, and users push back, saying they're still working on implementation of R/3 and data warehouse software.

14 **NEW JOB SITES** pay for referrals, even to people who don't work for the company doing the hiring.

16 **CONGRESS PASSES BILL** legitimizing digital signatures.

20 **JOB CRUNCH TAKES** center stage at World IT Congress in Taiwan.

28 **PRICE PALES** compared with customer service in online purchases, study shows.

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41 **SENATE DELAYS** its investigation of airline ticket exchange to focus on United Air Lines/US Airways merger.

44 **SECRET SERVICE** chases online criminals — with a lot of help from the user companies it protects.

47 **IT STRESS** comes primarily from increased workload, as employees fill in for workers who leave for other jobs.

WORKSTYLES

48 **WHAT'S IT LIKE TO WORK** at New York's Metropolitan Museum of Art? Pretty sweet, especially walking through the galleries to meetings.

50 **CIOs CLASH** with CTOs when the technology/business balance of their relationship goes off-kilter.

54 **BEST PLACES TO WORK:** Diversity and personalized benefits mark great IT shops. Both help retention and increase productivity.

TECHNOLOGY 71

73 **WIRELESS COMPUTING** was a big part of Microsoft's annual Tech-Ed conference this year.

74 **CANDLE CORP.** adds new features for its Java-based Web site monitoring tool.

78 **DEMAND GROWS** for bandwidth, inspiring development of new tools to manage Web content and traffic.

QUICKSTUDY

80 **XHTML** and how it can simplify life for Web developers.

FUTURE WATCH

82 **RESEARCHERS HOPE** to use quantum physics to develop better data encryption.

84 **LINKING EDI AND XML** will remain difficult until the XML market matures.

EXEC TECH

79 **HANDHELD WIRELESS** e-mail devices send and receive messages through paging services. Here are some of the surprising things you can do.

If Kmart can do it, there's no reason a nuclear weapons laboratory can't.

WIDO SCHWARTAU, SECURITY CONSULTANT, ON TRACKING DEVICES THAT COULD BE USED TO SECURE COMPUTERS AGAINST THEFT IN THE WAKE OF THE LOST DISK DRIVES AT THE LOS ALAMOS NATIONAL LABORATORY. SEE PAGE 8.

OPINIONS

32 **MARYFRAN JOHNSON** says an IT leader's title doesn't matter. What does is that the holders of those titles focus on the IT/business partnership.

32 **ERIK SHERMAN** says patenting Web-based processes can dehumanize business.

33 **MOHAN BABU**, a native of India who is now working in the U.S. on an H-1B visa, implores authorities to make it easier for foreigners to work here.

34 **JOHN GANTZ** writes about a future fortune in software "plumbing," or application integration software.

34 **WILLIAM M. ULRICH** says that to reap maximum benefits from the Internet, companies must integrate it in many dimensions.

48 **ED YOURDON** says IT is experiencing "déjà vu all over again" — but faster — with Internet legacy systems.

102 **FRANK HAYES** says IT managers must painstakingly decide how much time their charges should spend with users and within their own "cube farms."

AT DEADLINE

AOL Proposes Instant Messaging Standards

America Online Inc. last week proposed a standard protocol for instant messaging to the Internet Engineering Task Force, one week after the Federal Communications Commission began an investigation into AOL's instant messaging service. The IMX Architecture would allow "disparate systems to exchange messages and presence information," according to the draft.

SAP Strikes Deals

At its Sapphire user conference in Las Vegas last week, SAP AG announced two major deals – a contract to implement its mySAP.com software for 230,000 end users at Nestle SA in Vevey, Switzerland, and an agreement to invest $250 million in Commerce One Inc. in Pleasanton, Calif., and to resell that company's online marketplace software. SAP said the deal with Nestle is the largest software contract it has ever signed. For more on the conference, see page 12.

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Appeals Court Wants Microsoft Antitrust Case

But Department of Justice wants to go directly to Supreme Court

BY MITCH BETTS
WASHINGTON

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In that sense, Microsoft had a good week. The U.S. Court of Appeals — widely viewed as sympathetic to Microsoft because of a 1998 ruling in the company's favor — expressed eagerness to handle the current case.

The federal appeals court here issued an unusual order that it will take the Microsoft case with a seven-judge panel instead of the usual three-judge panel because of the national importance of the case.

"That appears to give Microsoft a little bit of a strategic edge," said Arlen Langvardt, professor of business law at Indiana University in Bloomington. Microsoft is eager to move to the appeals court — where it expects to be vindicated — and opposes the government's bid for a fast-track appeal to the U.S. Supreme Court.

The U.S. Department of Justice filed a motion asking U.S. District Court Judge Thomas Penfield Jackson to send the case directly to the Supreme Court, bypassing the appeals court to get a faster resolution of the 2-year-old litigation.

"One reason the government is twisting and turning so severely to avoid the Court of Appeals is that nothing good can happen to them there, especially when you look at this seven-judge panel," said William Kovacic, a law professor at George Washington University.

Two appellate judges overturned Jackson's 1998 ruling that the combination of Windows and Internet Explorer is an illegal "tying" of the browser to a monopoly product. But a defiant Jackson again ruled that the bundling is illegal.

Several legal analysts said the Supreme Court is less likely to snap up the case on direct appeal if it knows the Court of Appeals will handle the case swiftly and with seven judges instead of three.

One reason is that more judges can give the appeals court's ruling more credibility, said Robert M. Heller, antitrust attorney at Kramer Levin Naftalis & Frankel in New York. Also, it will speed up the case, perhaps cutting the appeals court's review from 12 months to five or six. Parties dissatisfied by a three-judge panel's ruling can ask for a rehearing by the full court, but the court last week eliminated that step.

Even if the government succeeds in a direct appeal to the Supreme Court, legal analysts said, the high court may decide not to hear the case and order the appeals court to sift through the issues first.

An equally important issue for Microsoft is obtaining a "stay" order that delays the onset of the conduct remedies imposed by Jackson. Microsoft filed a 39-page brief to the Court of Appeals last week seeking such a delay and arguing that the remedies would have a "devastating" effect on the company, its business partners and customers.

The government responded that Microsoft's motion should be tossed out because it was "premature." The government said that Jackson has the right to decide whether he will send the case to the Supreme Court — and if he does, the appeals court doesn't have jurisdiction over the case.

Words to the Court

Microsoft said Judge Jackson's conduct restrictions — unless they're blocked — would have the following "devastating" effects on the company, its business partners and customers:

1. **Result** in a confiscation of large amounts of Microsoft's intellectual property.
2. **Interfere** with Microsoft's release of new products such as its Windows Millennium operating system.
3. **Require** Microsoft to redesign all of its existing operating systems within six months of the judgment's effective date or else withdraw them from the marketplace.
4. **Force** Microsoft to immediately divert vast resources from software development to complying with the judgment and formulating the required breakup plan.
5. **Make** it difficult for Microsoft to conduct business in the highly-competitive, fast-moving software industry at a critical time when software is being transformed from stand-alone products to Web-based services.

[Note: These are direct quotes from the Microsoft filing.]

SOURCE: MICROSOFT CORP.'S JUNE 14 REPLY TO THE U.S. DEPARTMENT OF JUSTICE

Procter & Gamble Will Seek $100M in Gas Bids Online

May be largest energy deal on Net

BY MATT HAMBLEN

In a move analysts characterized as perhaps the biggest online play for corporate energy to date, Procter & Gamble Co. plans to use a new online market to purchase $100 million worth of natural gas to run its North American plants.

The Cincinnati-based consumer goods giant chose startup EnergyGateway.com LLC in Columbus, Ohio, to provide the marketplace starting July 1, officials at both companies said last week.

"Procter & Gamble recognizes the efficiencies and ultimate savings to be delivered from e-commerce," said Michele Kidd, purchasing manager at the $38 billion firm. Kidd declined to estimate P&G's savings from using the online energy market.

However, Kidd wouldn't rule out the use of other e-commerce companies for P&G's energy needs.

Despite the newness of its field, "EnergyGateway.com offered a unique combination of cross-regional expertise in the natural gas industry," said a P&G spokeswoman. Plus, EnergyGateway.com has the flexibility to tailor programs, data transmission and reporting formats nationwide, the spokeswoman added.

EnergyGateway.com officials said bids will be submitted for natural gas to run 59 P&G plants. The purchases could reach more than $100 million, depending on the bids, according to Mark Jergens, CEO of EnergyGateway.com.

This request for bids could be the largest posted on the Internet, said analyst Ethan Cohen at Aberdeen Group Inc. in Boston. Although P&G has used outside agencies to help lower its energy costs, the pact with EnergyGateway.com represents its first effort to purchase energy online, he added.

Natural gas sales made over the Internet reached roughly $10 billion last year. That number could reach $166 billion by 2004, according to Forrester Research Inc. in Cambridge, Mass. Those figures represent 2% of industry sales through all methods last year and nearly 25% of projected sales in 2004, Forrester said.

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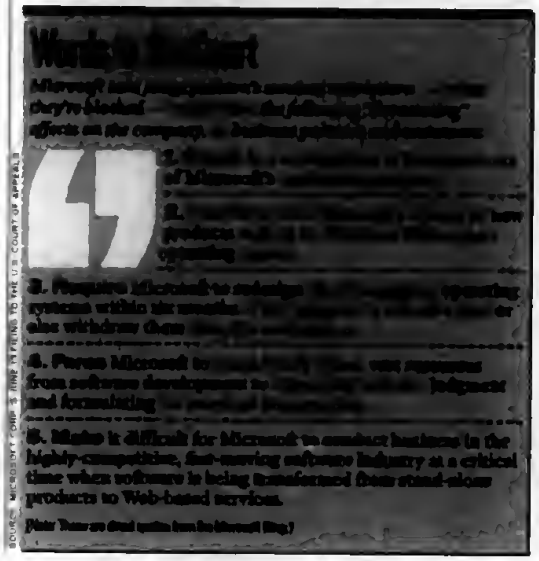
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COMPUTER ASSOCIATES

Banks Launch Effort To Purge Paper Checks

Electronic funds transfer systems piloted

BY MARIA TROMBLY

IN TWO RECENT offensives, U.S. banks have launched an assault on the dirty, inefficient check in an effort to replace it with nice, clean electronic funds transfers.

Last month, Wells Fargo & Co. teamed with San Jose-based eBay Inc. to offer electronic check payments to the auction site's customers — a service it plans to offer to other sites as well. Last week, Wells and 10 other banks launched a prototype of a system designed to let merchants scan in checks and give them back to customers.

Until June 6, eBay's regular sellers had to spend a significant amount of time processing checks by hand, said spokeswoman Ann Ruckstuhl.

EBay subsidiary Billpoint Inc. — which is also partly owned by San Francisco-based Wells Fargo — on May 25 rolled out a pilot online payments program io which buyers can transfer money from their checking accounts to merchants' accounts using a secure Web browser. Billpoint handles the transactions. The program, which will go fully live at the end of the summer, costs sellers 35 cents per electronic check, Ruckstuhl said.

EBay was a good place to launch the online payments program, because a financial link between consumers was the only missing part of the transaction, said Keo Kerr, an analyst at Stamford, Conn.-based Gartner Group Inc.

Although the $4 billion that eBay expects to handle this year is a huge potential market for electronic checks, Billpoint inteods to expand to other trading sites, Ruckstuhl said.

Safety in Numbers

Meanwhile, Wells Fargo and 10 other banks, including Bank of America Corp., The Chase Manhattan Bank and Citibank, joined together in the SafeCheck pilot program.

International Check Services Inc. (ICS) in Riverdale, N.J., supplies merchants with a device that scans checks, then ICS authenticates those checks. New York-based SVPCo, which represents 20 of the nation's largest banks, will replace ICS's back-end authentication procedure with an electronic funds transfer that puts the mooey directly into the merchant's bank account.

Their goal is to stop banks from having to move paper checks through their systems and letting the customer keep the voided paper version.

The point of sale is a good place to introduce the check-digitizing process, said SVPCo President Hank Farrar, because of the high cost of fraud and the system's ability to spot phony accounts.

A pilot versioo of the program has been running for two weeks, and a full launch is expected in two to three months, Farrar said. The banks involved in the system represent about 51% of U.S. bank deposits as of April, a total of more than $2 trillion. ◗

Online Payments

HOW BILLPOINT WORKS:

- Buyers enter their checking account information.
- The money is electronically transferred to the merchant.
- The merchant is e-mailed that the money was sent.

HOW SAFECHECK WORKS:

- A merchant scans in a check.
- The money is transferred electronically.
- The paper check is voided.
- If the bank account isn't from a member bank, the check is treated traditionally.

Nasdaq Says It Will Meet Revised Decimalization Deadline

SEC extends change due date to April

BY MARIA TROMBLY

The Securities and Exchange Commission has moved its decimalizatioo deadline — the date by which the stock markets have to convert from fractions to decimals — from oext month to next April, after Nasdaq Stock Market Inc. said it would be unable to meet the original deadline.

However, a pilot project that includes some of the stocks listed on the New York Stock Exchange will begin Sept. 5.

New York-based Nasdaq — which the SEC has indicated is the main obstacle to the conversioo from fractional to decimal stock pricing — said it was unable to begin the switch to decimal pricing by the earlier deadline of July 3 because of unexpected volume growth. But Nasdaq CEO Frank Zarb told Congress last week that the exchange will be ready by next March.

The options exchanges are also an obstacle to decimalization. Options are prior agreements to buy or sell a stock at a certain time for a certain price. A single stock can be associated with as many as 100 or more options, said Larry Tabb, an analyst at Needham, Mass.-based TowerGroup.

As a result, be said, the volume problems already experienced by Nasdaq could be exacerbated on the options exchanges when decimal pricing goes into effect. Stock prices could change more frequently because they will be priced in smaller increments. "The options pricing really has the industry scared," Tabb said.

After the switch to penny pricing, volumes could triple, said Gary Katz, a spokesman for the new International Securities Exchange LLC (ISE), an options exchange in New York.

"The volume is not the problem," he added. "It's quoting capacity that's the problem."

Specifically, the system that enables the options exchanges to share price information — the Options Pricing Reporting Authority (OPRA) — may not be able to handle the heavier traffic, Katz said.

The ISE and the four other U.S. options exchanges have formed a quote-mitigation committee. Possible solutions include a switch to nickel-based, rather than penny-based, decimal pricing; and not reporting prices for low-volume issues, said Dana Stiffler, an analyst at Newton, Mass.-based Meridien Research Inc. She noted that OPRA is undergoing system upgrades but suggested that they may not be enough for the marketplace after decimalization.

Meanwhile, the all-electronic ISE is already prepared to switch to decimals, Katz said.

According to the SEC's order, the stock market must begin a pilot project to convert to decimal pricing of some NYSE stocks by Sept. 5, begin phasing in Nasdaq decimal stock pricing by March 12, 2001, and be completely switched over by April 9, 2001. ◗

Computerworld Wins Eight Press Awards

BY ROBERT L. SCHEIER

Computerworld last week received eight awards from the American Society of Business Press Editors, including two Gold Awards for the publication's redesign and for its May 10, 1999, News section.

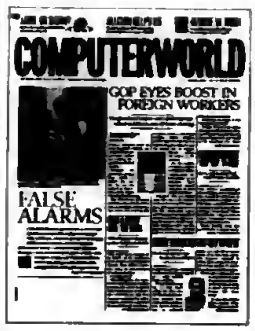
The redesign, for which *Computerworld*'s design team won a Gold Eastern Regional Award, "was the result of months of hard work and has proved very popular with our readership," said editorial director Patricia Keefe.

The newspaper won a Gold Regional Award for its May 10, 1999, News section. "That section is an example of the week-lo and week-out quality provided by our staff," said Keefe.

A third Gold Award was received for the Best Regularly Contributed Column. The Driving the Deal column in *Computerworld*'s Business sectioo is written by columnist Joe Auer and was edited by Rick Saia and Allan E. Alter.

The following were among the other regional awards the publication received:

- Silver Award to associate art director April O'Connor for her design of the Aug. 9, 1999, front page (at right).
- Silver Award for Single News Article to feature writer Matt Hamblen, for his Oct. 11, 1999, article "Users Decry Big MCI/Sprint Deal."
- Bronze Award for Special Section, to the editorial staff for *Computerworld*'s year-end issue, "The Next Decade: 20 Visionaries, 10 Years, One Future," which ran Jan. 4, 1999.
- Bronze Award to features art director Stephanie Faucher for her design of the Exec Tech feature, "Eeek! Mice and More," of April 19, 1999.
- Bronze Award for Single News Article to the news team of Patrick Thibodeau, Kim S. Nash, David Orenstein and Mark Hall for "Judge Slams Microsoft," Nov. 8, 1999. ◗


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BRIEFS

Computer Companies Blamed in Jet Crash

A federal jury in Miami last week found Honeywell Air Transport Systems in Phoenix and software vendor Jeppesen Sanderson Inc. in Englewood, Colo., were partly responsible for the 1995 crash of an American Airlines plane in Colombia that killed 159 people. During the flight from Miami to Colombia, the pilots entered an incorrect code into the flight computer, sending the Boeing 757 into a mountainside.

Well-Timed Egg Offering Nets $225M

Shares of Egg, the Internet banking arm of life insurer Prudential PLC, jumped 19%, with its initial public offering nine times oversubscribed last week. The offering, which raised $225 million, was a relief to London-based Prudential, as several recent Internet offerings had been canceled due to Internet flame-outs. Created less than two years ago as a telephone-based bank, Egg – with a valuation of $1.95 billion – quickly morphed into an Internet-only operation. Egg has more than 1 million customers.

Growing, Growing, Gone

Question: What grows 20% per year, generates more than $2.5 billion in sales and makes computer chips, lasers and other products for the hot optical networking market? Answer: Murray Hill, N.J.-based Lucent Technologies Inc.'s microelectronics division, which may be spun off with a value of about $50 billion. The division's products help speed voice, video and data traffic on fiber-optic networks.

Windows 2000 Runs On 32 Processors

At an event in Tokyo last week, Unisys Corp. demonstrated Windows 2000 Datacenter running on a 32-processor version of its ES7000 server. Microsoft Corp. was expected to ship Windows 2000 Datacenter to original equipment manufacturers 120 days after the Windows 2000 launch, but that deadline has passed.

Denial-of-Service Victims Share Lessons Learned

NetSec 2000 panelists preach prevention

BY ANN NARRISON
SAN FRANCISCO

When online news service ZDNet Group was hit with a ferocious denial-of-service attack in February, its server was overwhelmed with 50% to 100% more data traffic than its peak load, rendering three-quarters of the site inaccessible for almost three hours.

But "when the attacker decided it was over, it was over," said Alex Wellen, a producer at ZDNet TV who spoke at a panel discussion at the NetSec 2000 computer security conference here last week.

Wellen and panelists from Cisco Systems Inc. and Stanford University who have also weathered denial-of-service attacks offered lessons they learned from the incidents and strategies for effective defense.

A rash of distributed denial-of-service attacks against e-commerce sites in February used floods of data packets to overwhelm servers and choke access to the sites. Attackers scanned remote machines for vulnerabilities and secretly loaded software that used the compromised machines as agents in attack networks that were harnessed against targeted sites.

Batten the Hatches

But the threat posed by these types of attacks was well-known before February. Cisco was hit by a denial-of-service attack in October while participating in an online benefit concert. NetSec panelist Eliot Lears, a consulting engineer at Cisco, said the company had prepared ahead of time by working with its Internet service provider (ISP) and setting its intrusion-detection system to identify the signature for that type of denial-of-service "smurf" attack. Such attacks use Internet Control Message Protocol (ICMP) packet traffic.

"We had our ISP rate limit the amount of traffic ICMP could send," said Lears. "You want to establish close coordination with your ISP before an attack."

AT A GLANCE

Protective Measures

Tips on preventing denial-of-service attacks from former targets of such attacks:

- Monitor your own network to make sure your machines are not being compromised for a denial-of-service attack network
- Hire multiple Internet service providers that can provide failover during attacks, increase aggregate bandwidth and distribute Web sites on networks around the world
- Disable IP directed broadcast capability, which can be triggered by a malicious incoming packet to flood other hosts in the network with replies
- If you are a customer of a co-location site where you sign up for secure services, investigate what kind of protection you will receive from fellow customers

Tracking the Culprits

Lears also noted that Cisco routers can he set up to create an access list that logs the source address of malicious packets and helps service providers track them to the source.

David Brumley, an engineer for the Stanford University security team, said targeted sites can ask their service providers to trace the machine address of the packets through each router on their network and contact other providers if the packets jump network boundaries.

A Stanford University computer was used in a 700M bit/sec. smurf-type denial-of-service attack against eBay Inc. in February, he said.

"Luckily, we had a logging mechanism in place beforehand and could go back to logs and contact the sites where the smurf was coming from," said Brumley. "Law enforcement is well-prepared, but you have to give them a case they can prosecute, you have to give them logs," he added.

Logs Are Key

Brumley said that many machines don't keep logs, and attacks that spoof packet addresses are difficult to trace unless data is collected during the attack.

He also warned that many Internet service providers aren't willing to trace packets and get data in real time unless it is a big attack. Companies should develop contacts with law enforcement agencies and he prepared to quantify financial losses to overburdened investigators.

Missing Disks Highlight Need for Security

Feds launch probe into Los Alamos incident

BY JAIKUMAR VIJAYAN

An embarrassing loss of computer disks containing classified nuclear information at the Los Alamos National Laboratory highlights the need for companies and other organizations to have solid procedures in place to enforce their technology security policies, according to several security analysts.

The New Mexico-based laboratory last week said the U.S. Department of Energy and the FBI have launched a joint inquiry into the disappearance of the two hard drives. The loss was reported to the Energy Department on June 1, several weeks after officials at Los Alamos first discovered that the drives were missing from one of the laboratory's most secure vaults.

Organizations such as the Los Alamos lab usually have very tight policies regulating access to sensitive information, said Winn Schwartau, a security author and founder of security consultancy Interpact Inc. in Seminole, Fla. But the disappearance of the disks shows the importance of having formal enforcement procedures backing up the policies, he added.

Policy Enforcement

"You can make all the security policies you want, but unless you have procedures in place to mandate those policies and to make sure they are being complied with, something will go wrong," Schwartau said.

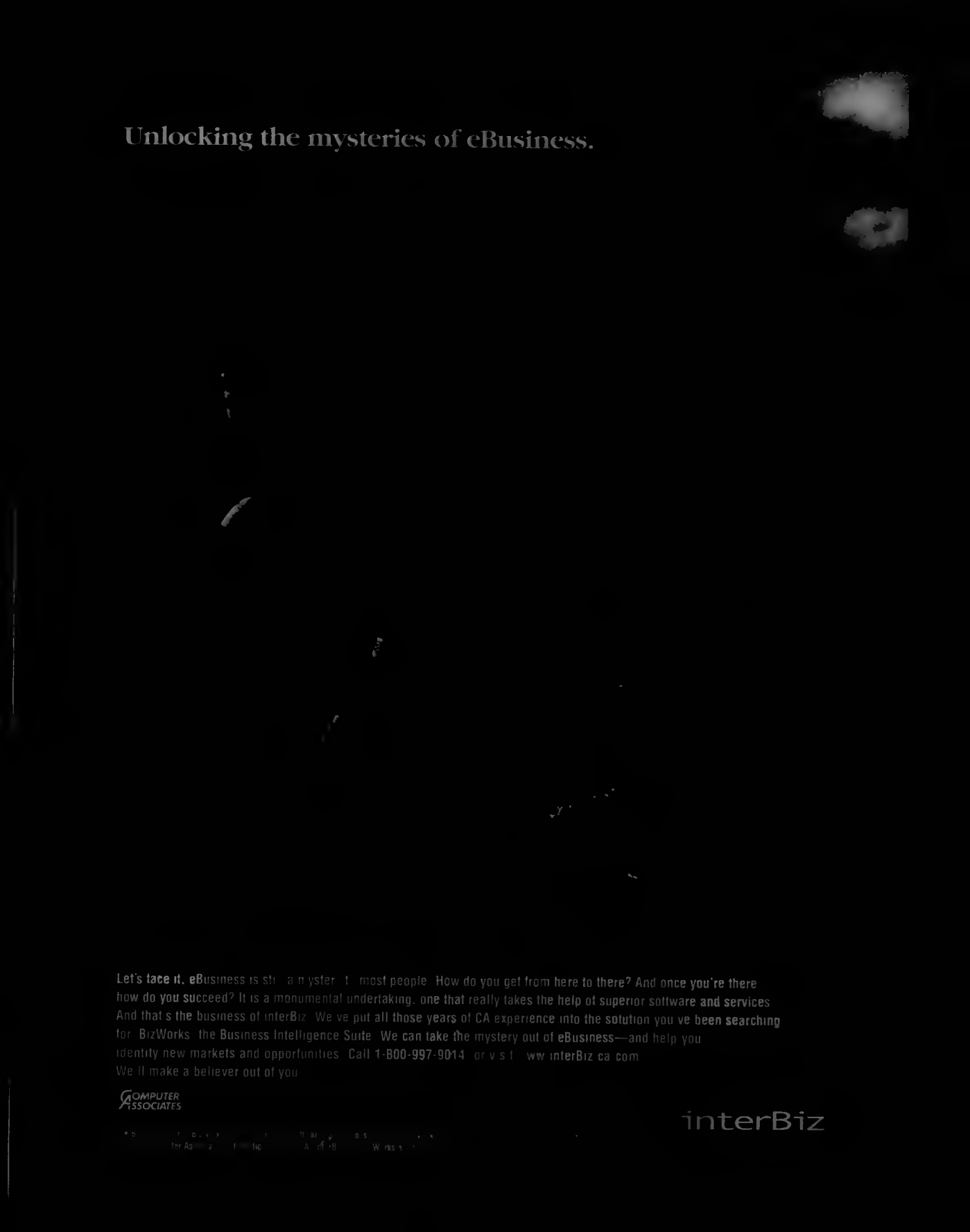
It also sometimes makes sense to use tagging technologies that allow stolen computers and parts, for instance, to be tracked via radio signals, Schwartau said. "If Kmart can do it," he reasooed, "there's no reason a nuclear weapons laboratory can't."

The computer disks reportedly contained information on how to disarm Russian and U.S. nuclear devices. But Ed Curran, director of the Energy Department's office of counterintelligence, said there "is no evidence that suggests espionage is involved in this incident."

Ira Winkler, an analyst at Internet Security Advisors Group in Severna Park, Md., said that even when a company has tough access regulations for particular sites, it's not unusual for unauthorized visitors to get into sensitive areas "because people feel enforcing an access policy would hurt the other person," Winkler said.

"Sometimes, no matter what policies you have in place, security ultimately comes down to trust and human nature," said Eric Hemmendinger, an analyst at Aberdeen Group Inc. in Boston.

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Cross-Border Transactions Get Online Lift

BY MARIA TROMBLY

A flurry of alliances and new platforms is about to jumpstart the nascent field of electronic cross-border payments.

Until recently, only the first pieces of a trade could be performed online — exploration, negotiation and the actual placement of the order.

"But you still have to automate financing, fulfillment and payment," said Avivah Litan, an analyst at Stamford, Conn.-based Gartner Group Inc.

Not for long. Companies and industry groups are about to tackle all three of these issues, with TradeCard Inc. in New York going after online transaction settlements for importers and exporters.

It's a major opportunity. Global e-commerce will grow to a $7.3 trillion market by 2003, according to Litan. By next year, at least 20 companies are expected to offer end-to-end applications for cross-border electronic purchasing and payments, said Litan.

Last week, Detroit-based Comerica Inc. became the first U.S. bank to sign an agreement with TradeCard. Under the deal, Comerica will market TradeCard products and provide support to its customers.

Trade Gets a Makeover

The traditional way of moving money around for international trades involves letters of credit or direct payments, either on delivery or some later date.

That process can be slow, expensive and risky, said Mike Rinkus, Comerica's first vice president of international trade service. With TradeCard, importers should expect to see 60% to 70% cost savings over traditional payment mechanisms, he said.

Rinkus said a number of middlemen are eliminated by a TradeCard financial transaction, leading to an estimated time savings of 30% or more.

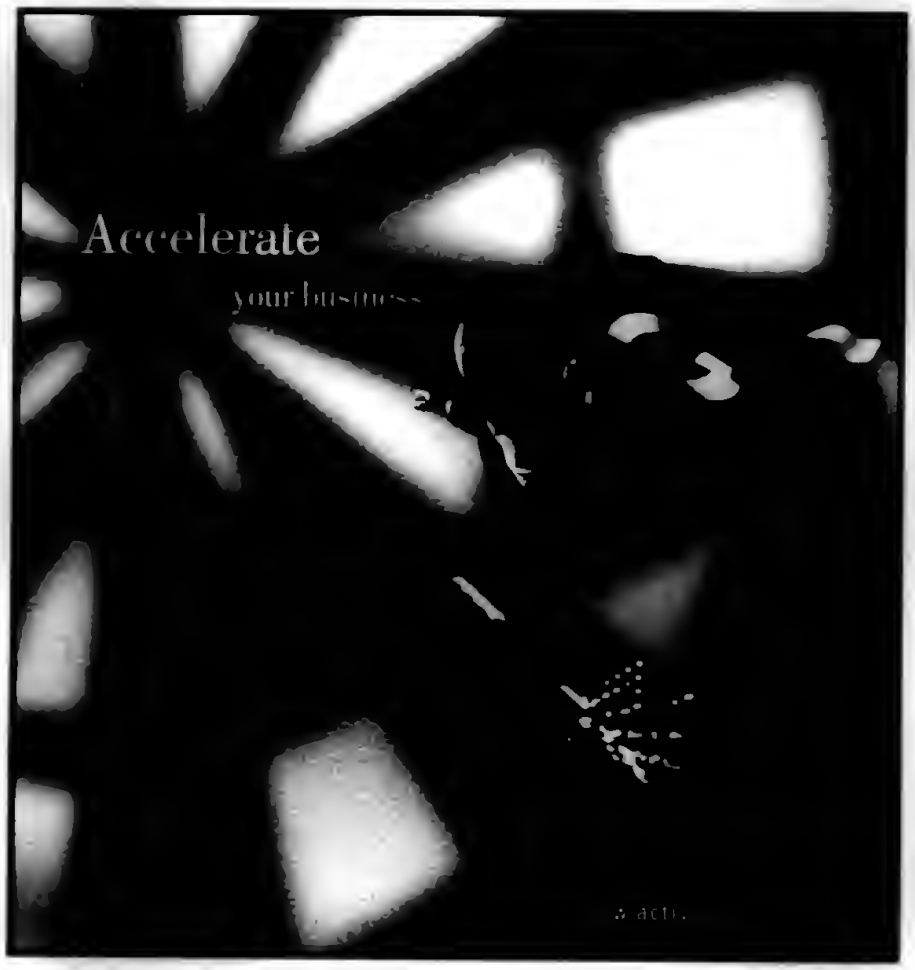
Banks in Hong Kong and Taiwan also signed up to use TradeCard last week, as did New York-based electronics chain RadioShack Corp., which became the first U.S. company to complete a series of international transactions using the TradeCard system.

While TradeCard streamlines and automates the existing payment process, companies like London-based Orbian Management Ltd. offer a whole new way of looking at money.

What Orbian offers is a lot like an electronic IOU — the buyer of a product sends an electronic certificate to a seller, which can then redeem it at a discount, redeem it at its maturity or use it to buy products from its own suppliers.

Orbian's product is attractive because the company doesn't actually lend money but does guarantee the ability of other businesses to pay for goods or services. Also, the cost for an Orbian credit is equal to an annual rate of 0.5% interest.

Orbian, which is signing up early adopters, plans to go live in September.



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Users at Show Say Move to MySAP.com Still a Ways Off

Sapphire attendees question how easy it will be to use

BY JULIA KING
LAS VEGAS

Despite SAP AG's all-out push to move user companies to mySAP.com, SAP's electronic-business computing platform, it seems many simply aren't ready to do so and won't be anytime soon.

The Toro Co. in Bloomington, Minn., is one example.

The lawn mower manufacturer is upgrading to the most recent version of SAP's R/3 enterprise applications and has yet to implement SAP's data warehouse software, known as Business Warehouse.

"I like the mySAP.com strategy, but we won't get there anytime soon," said Dennis Anderson, Toro's manager of worldwide order services, at SAP's Sapphire user conference here last week. "We have limited resources, and it would take a lot of implementation and planning to do [mySAP.com]. We're still struggling with the Business Warehouse."

But that has not stopped Toro from tapping the Internet for business-to-business commerce, Anderson noted. Earlier this year, the company set up a Web site linked to its back-end R/3 applications. Six months later, the Web site is generating 13% of Toro's revenue and has cut the time-consuming rekeying of order data.

Charlotte, N.C.-based Celanese Corp. also plans to go live on Version 4.6, the latest version of SAP R/3, later this year.

But "we won't be ready to jump to mySAP.com two years after that," said Ken Dawson, information technology manager at Celanese. Dawson said he's skeptical of SAP's promise of a simple-to-use, highly intuitive, no-training-necessary Internet-based software. "SAP has a great deal of ground to make up if it'll truly be that easy to use. Today, it takes a great deal of effort to run a business on SAP [R/3]," Dawson said.

At last week's user conference, Hasso Plattner, SAP's cofounder, predicted that 75% of current SAP R/3 users will have migrated to mySAP.com in three years.

With dozens of screens suspended from the rafters of the Sands Convention Center — displaying charts, triangles and squares connected by lines and two role-playing assistants — Plattner demonstrated his vision of the future.

It involved virtually all of a company's employees logging on to mySAP.com to reach SAP and non-SAP applications as well as services from a single customized workspace.

But SAP has struggled to get its users to understand exactly what mySAP.com is and how they can transition from R/3. MySAP.com combines R/3 and companion applications for tasks such as supply-chain planning and customer relationship management with an Internet portal.

"MySAP.com seems to be all things to all people," Anderson said.

Plattner conceded that "it took me a year to explain what I mean by business scenarios," a term SAP uses to describe cross-company activities, such as collaborative product design over the Internet. ◗

IT Execs to Trade Tips At Premier 100 Confab

Security, B-to-B, hiring will be hot topics

BY MATT HAMBLEN

WILL ONLY the paranoid IT leaders survive? For the most part, yes, said several high-level IT managers who are attending the first *Computerworld* Premier 100 IT Leaders Conference starting today in Palm Desert, Calif.

CIOs and others said in interviews that they want to compare notes with their peers on topics that cause them worry. Nearly 400 people are expected to attend, including 240 CIOs and other high-level information technology executives. (For updates, go to *www.computerworld.com.*)

Priscilla Tate, executive director of the New York-based Technology Managers Forum, is moderating a panel today titled, "Enterprise Security: Will Only the Paranoid Survive?" There's no such thing as Internet security, she says, which means IT leaders really do need to be paranoid and convene risk-management teams inside their companies to cope.

These teams need to throw together business managers, IT workers, auditors, human resources managers and even corporate lawyers to hammer out policies, Tate said.

To run the team meetings, IT leaders need to be prepared to explain technologies to non-IT personnel.

One attendee, Rick Nolle, vice president of systems at Reinsurance Group of America Inc. in Chesterfield, Mo., said his company now uses the Internet for connections with hundreds of other insurance companies, but only after years of slow acceptance. "The insurance business has been called the Amish of technology, since we are old-fashioned and happy about it," he said.

Sleepless Over Standards

But IT is changing rapidly for insurers, and Nolle said his biggest sleep-depriver is getting Internet standards to evolve faster. To help, he has set up a group of peers to build de facto Internet standards for the insurance trade.

Appearing on a conference panel titled "The Naked Truth About B2B E-Commerce" are Robert Schwartz, vice president at Matsushita Electric Corporation of America in Secaucus, N.J., and Kathy Brittain-White, CIO at Cardinal Health Inc. in Dublin, Ohio.

Schwartz and Brittain-White said the keys to their early success with business-to-business e-commerce come from building a business need and design before weighing technology factors. "There needs to be a clear definition of the business process," Schwartz said, "and if your back-office operations aren't optimized, all you do is hit the wall at high speed."

Nagging every IT leader is how to retain top workers, especially against the lure of stock options at dot-coms. A panel on Wednesday will be devoted to "How to Win the Hiring War Between the 'Dots' and the 'Nots.'" ◗

PREMIER 100

Who are Computerworld's *Premier 100 IT leaders?*

- Average experience is 23 years.
- 49% have graduate degrees; just 17% said their undergraduate degrees were in computer science.
- Leaders average 729 employees reporting to them, with average support of 34,000 users.
- 3% of the total have IT budgets over $1 billion.
- For the complete list of leaders, go to *www.computerworld.com/premier100*

HP Unix Upgrade Increases Support for Java, Linux Apps

BY JAMES COPE

A more responsive Java and improved compatibility with Linux sparked user and analyst interest in Hewlett-Packard Co.'s announcement last week of an upgrade to its Unix operating system.

James Barrese, vice president of engineering at Charitableway.com, an application service provider for charities in San Carlos, Calif., said he would move to the new version as soon as it's available. HP plans to start shipping HP-UX11i on its computers before the end of the year.

Barrese said he's particularly interested in the increased speed for Java programs. Although Java applications aren't as fast as those written in C++, Barrese said, using Java speeds up the process of writing, testing and deploying Web-based software. "Everyone's turning to Java [for Web development]," he said. "Application development goes much faster [with Java]."

The upgraded Unix operating system builds in end-to-end network support for Internet companies and enterprises, according to HP. It's more scalable than its predecessor and includes a central control manager application for managing multiple HP-UX systems from a single point.

Al Gillen, an analyst at International Data Corp. in Framingham, Mass., said the capabilities included in HP-UX11i, such as the Wireless Application Protocol server from Finland's Nokia Corp. and improved manageability and security, would be important to customers. Gillen also noted that HP now gives users more migration options — HP-UX11i supports Linux applications and will be able to run on Intel Corp.'s forthcoming 64-bit Itanium processor as well as HP's PA-RISC chip.

Barrese said he agrees with Gillen's view of HP-UX and Linux interoperability. "I can pull Linux tools and applications into the high end where Linux can't scale," he said. ◗



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BRIEFS

AOL: Messenger Can Play Well With Others

America Online Inc. submitted a proposal to U.S. regulators detailing how its instant messaging software would work with competing systems. AOL's proposed $124 billion takeover of Time Warner Inc. pushed the Federal Trade Commission to scrutinize AOL's dominance of the instant messaging market. Swallowing Time Warner's broadband cable network could help AOL further control the instant messaging market.

Union Pacific Melds Tech Under New Firm

Union Pacific Corp. in Omaha announced last week it will consolidate its technology-related businesses under a new company called Fenix. The company will be based in the Dallas/Fort Worth area and will concentrate on advanced technologies and businesses such as wireless access and broadband connectivity.

Red Hat Sales Jump, Net Loss Widens

Red Hat Inc. lost $2.5 million, or 2 cents per share on an adjusted basis, for the first quarter of fiscal 2001, compared with $3.8 million, or 8 cents per share in the same quarter a year earlier. On a reported basis, the Durham, N.C.-based Linux distributor's net loss was $14.9 million, or 10 cents per share, for the quarter ended May 31, compared with a net loss of $4.1 million, or 8 cents per share, for the year-earlier period. Sales totaled $16 million, up from $8.2 million.

Perot Systems Sinks

Ross Perot, the billionaire and one-time presidential candidate, said last week that the computer services company he founded, Perot Systems Corp., will report lower sales and profits for the second quarter compared with the same period last year. He blamed the shortfall on cost cuts at the company's largest customer, UBS AG in Switzerland, which accounts for almost 30% of Perot Systems' business.

Recruiters Broaden Hiring Channels

Tight labor market prompts some firms to offer referral bonuses to outsiders

BY JULEKHA DASH

Employee referrals and agencies have long been the backbone of corporate hiring strategies. But now some companies are willing to pay for referrals from people who work neither for them nor for a professional recruiting firm.

Internet software and services firm Allaire Corp. in Cambridge, Mass., for instance, will offer $1,500 to anyone who refers a candidate who's hired for one of the five positions listed on job board Refer.com.

Launched two weeks ago, Cambridge-based Refer.com collects a fee equal to the reward price that employers are willing to offer. (Employers can have some of this money refunded if the new hire stays fewer than 90 days, and they pay only after the candidate is hired). Currently, Refer.com lists 75,000 openings, most of them information technology positions, according to a company spokesperson.

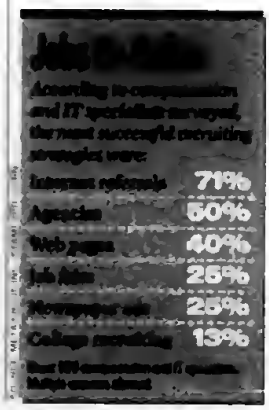
Comsys Inc., a Houston-based IT staffing firm, is also expanding its recruiting channels to include the general popolace. But instead of simply passing along names, these "virtual recruiters" will have accounts at major job boards and administer skills tests to potential hires, said Comsys Vice President Amir Alavi.

Karen Davis, manager of recruiting strategy at Allaire, said she hopes the service will attract passive job candidates. "If [the referral] comes from word of mouth, it has the potential of getting us in front of an untapped audience," she said. The pervasiveness of e-mail and job-hopping has facilitated networking, making it more likely that informal referrals will take place, she said.

Davis, who said she expects to eventually list all of Allaire's job openings on the service, estimated that Refer.com will help her attract three new hires per quarter. Allaire will add as many as 300 employees by year's end. Refer.com won't replace Allaire's 10 full-time recruiters, but it "gets us extra eyeballs we may not get" otherwise, Davis said.

Barbara Gomolski, research director at the Gartner Institute in Eden Prairie, Minn., said the tight labor market has led to a renewed interest in referral programs. Though Refer.com offers a new venue for attracting candidates, she said companies should consider rewarding former employees and others who have "loose attachments" to the company, rather than just anyone.

The service costs less than the typical $20,000 to $40,000 that companies pay recruiters to find IT employees, said Gomolski. But in the case of Comsys, its own 100 full-time recruiters will mentor the unseasoned headhunters. ▶



Health Care Orgs Plan to Boost IT Spending in 2001

Goals are to reduce long-term costs, boost efficiency

BY JULEKHA DASH

Next year, many health care organizations plan to ramp up the amount of money they spend on IT — largely because of how tight the rest of their budgets are.

As health care providers plan their budgets for next year, most of them plan to increase their information technology spending in an effort to reduce long-term costs using technology that makes them more efficient while simultaneously improving the quality of care — which users and analysts said are the twin goals of any health care organization.

On average, health care providers will increase spending between 6% and 8% next year, according to Mark Anderson, a vice president at Stamford, Conn.-based Meta Group Inc. and a former hospital CIO. Anderson based his findings on a Meta Group survey of almost 900 health care providers, released last month.

Although cutbacks in federal reimbursements for health services have eaten into hospital budgets, they have also forced health care providers to run leaner operations, according to Simmi Singh, a vice president in the health division at Internet services firm SeraNova Inc. in Edison, N.J.

Eliminating Inefficiencies

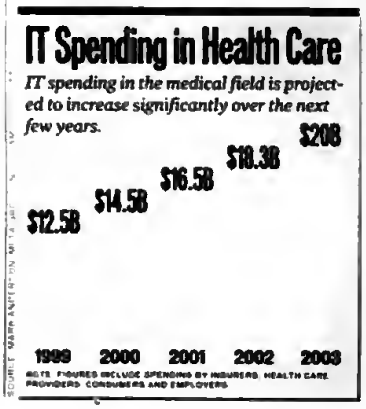
Eliminating inefficient processes or cutting staff freed enough money at many organizations to let them put more dollars in IT projects that make them even more efficient, Singh said.

Greg Walton, vice president and CIO at Carilion Health System, a group of seven hospitals in Roanoke, Va., said his company may shift money to IT from operating units such as human resources and accounting. He said he doesn't know if his IT budget will increase, but if it does, it will rise by 10% at most. The health system spent $20 million on IT this year.

Carilion won't finalize its 2001 budget for at least another month, but Walton said new technologies for next year will include applications that better capture emergency- and operating-room data in a centralized fashion. Having one applicatiun rather than dozens tracking this information will reduce the time staffers spend phoning or faxing varioos departments, he said. Walton estimated that this could save Carilion $25 per patient case.

Walton also plans to invest in an automated drug dispensing system, which could reduce medical errors and save nurses from counting pills.

Some organizations, such as Memorial Care, a group of five hospitals in Long Beach, Calif., will invest in wireless devices. Scott Cebola, Memorial's executive director of information services, hopes that physicians using handhelds instead of written orders to prescribe drugs will reduce errors. ▶



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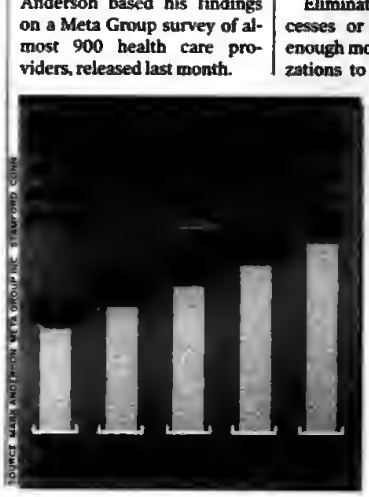
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BY JULEKHA DASH

Next year, many health care organizations plan to ramp up the amount of money they spend on IT — largely because of how tight the rest of their budgets are.

As health care providers plan their budgets for next year, most of them plan to increase their information technology spending in an effort to reduce long-term costs using technology that makes them more efficient while simultaneously improving the quality of care — which users and analysts said are the twin goals of any health care organization.

On average, health care providers will increase spending between 6% and 8% next year, according to Mark Anderson, a vice president at Stamford, Conn.-based Meta Group Inc. and a former hospital CIO. Anderson based his findings on a Meta Group survey of almost 900 health care providers, released last month.



SOURCE: META GROUP INC., STAMFORD, CONN.

Although cutbacks in federal reimbursements for health services have eaten into hospital budgets, they have also forced health care providers to run leaner operations, according to Simmi Singh, a vice president in the health division at Internet services firm SeraNova Inc. in Edison, N.J.

Eliminating Inefficiencies

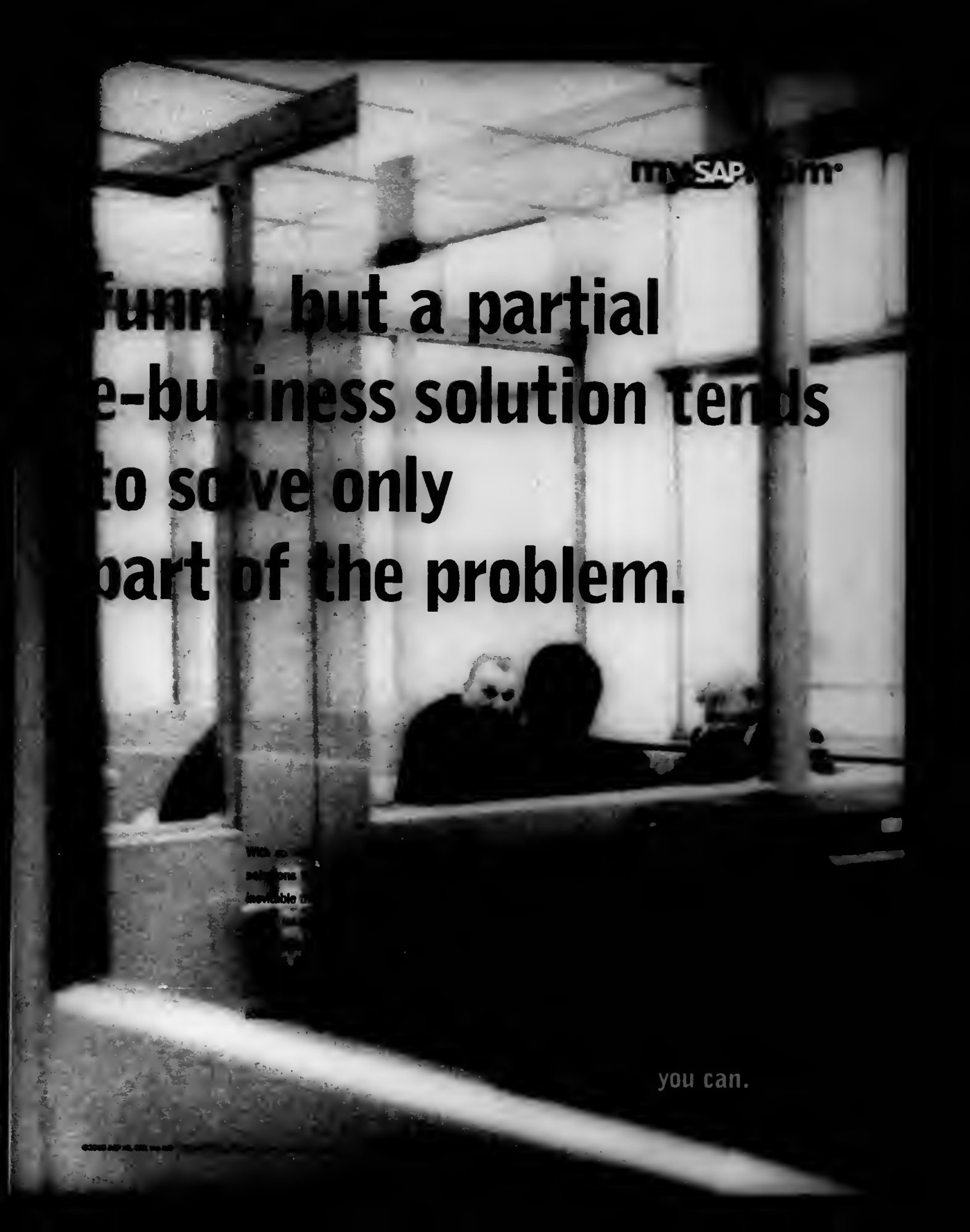
Eliminating inefficient processes or cutting staff freed enough money at many organizations to let them put more dollars in IT projects that make them even more efficient, Singh said.

Greg Walton, vice president and CIO at Carilion Health System, a group of seven hospitals in Roanoke, Va., said his company may shift money to IT from operating units such as human resources and accounting. He said he doesn't know if his IT budget will increase, but if it does, it will rise by 10% at most. The health system spent $20 million on IT this year.

Carilion won't finalize its 2001 budget for at least another month, but Walton said new technologies for next year will include applications that better capture emergency- and operating-room data in a centralized fashion. Having one application rather than dozens tracking this information will reduce the time staffers spend phoning or faxing various departments, he said. Walton estimated that this could save Carilion $25 per patient case.

Walton also plans to invest in an automated drug dispensing system, which could reduce medical errors and save nurses from counting pills.

Some organizations, such as Memorial Care, a group of five hospitals in Long Beach, Calif., will invest in wireless devices. Scott Cebula, Memorial's executive director of information services, hopes that physicians using handhelds instead of written orders to prescribe drugs will reduce errors. ▶


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Congress OKs Signatures Bill

Critics fear it's not tough enough

BY TODD R. WEISS

BOTH HOUSES OF Congress last week approved a bill that will allow many electronic signatures to have the same legal standing as paper signatures.

The measure passed the House by a vote of 426–4. It was approved by the Senate 87-0.

"We think this is the landmark e-commerce legislation of this session of Congress," said Cesar Conda, an administrative assistant for Sen. Spencer Abraham (R-Mich.). "Once it is in place, it will lead to an explosion of e-commerce." Abraham served on the Hnuse/Senate conference committee that last week agreed to this compromise version of the bill.

Conda said the bill provides federal laws to regulate the use nf digitally signed contracts and transactions that span state lines. "It provides a national framework for legal certainty across all 50 states," he said. "That framework currently doesn't exist."

The bill will now go to President Clinton, who has indicated that be will sign it into law.

David Butler, a spokesman for the Washington-based Consumers Union, said the measure is a welcome package of protections for consumers and business online. "This bill, if enacted, will provide adequate protections for consumers looking to sign off on major business transactions using the Internet," Butler said.

Among the protections in the bill, according tn Butler, is a requirement that consumers give their fnrmal consent to accept electronic documents when signing a contract. If consumers at a later date change their minds, they may revert to paper documents.

The measure would also require businesses to ensure that consumers who agree to electronic documents have the proper computer hardware and software tn receive, open and read the documents, Butler said. Thai can be done by sending a test message using the same software as the electronic documents to ensure they can be opened and read.

The bill creates rules for the use of electronic signatures as legal, binding agreements and outlines cases when only written signatures can be used.

Some critics have assailed the bill as not tough enough to protect consumers from fraudulent use of their electronic signatures. The biggest fear, critics argue, is the possibility of identity theft using electronic signatures.

Certain types of electronic signatures and documents won't be allowed under the bill.

- Court documents
- Utility cancellation notices
- Foreclosure or repossession notices for primary residences

Washington Roundup

Information technology has been a major factor in the productivity gains of the U.S. economy since 1995, Federal Reserve Board Chairman Alan Greenspan said in a speech last week.

Greenspan said IT has made it possible for employees to work fewer hours to produce a given level of goods and services in the economy, while computer modeling has reduced design costs. Plus, IT has given businesses timely information about customer demand and reduced the need to carry excess inventory.

"Before this revolution in information availability . . . decisions were made from information that was hours, days or even weeks old," Greenspan said. That forced companies into "doubling up" inventories and people so they'd be prepared to handle unexpected demand, he said.

Greenspan concluded that the IT-driven productivity gains are irreversible "in the sense that knowledge once gained is almost never lost. Having learned to employ bar-code and satellite technologies, for example, we are not about to lose our capability in applying them," he said.

■ Motorola Inc., Oracle Corp. and Cisco Systems Inc. were the leading users of the H-1B visa program for foreign high-tech workers from last October to February, according to a tally from the U.S. Immigration and Naturalization Service.

Motorola had 618 H-1B visa petitions approved during the five-month period, followed by Oracle (455) and Cisco (398). Other major vendors on the list included Intel Corp. (367), Microsoft Corp. (362) and Sun Microsystems Inc. (182).

IT user companies are also on the H-1B visa list, including Merrill Lynch & Co. (87), Nationwide Insurance Cos. (85) and The Goldman Sachs Group Inc. (75). The list covered a period of time when companies were in the final stages of fixing the year 2000 date rollover problem and needed foreign programmers for the labor-intensive task.

■ When it comes to taxing e-commerce, business executives say consistency across political jurisdictions is more important than a tax ban or moratorium, according to a survey by KPMG International in New York. Nearly 40% of the 270 corporate finance and tax managers surveyed said they want "a consistent, simplified e-commerce tax policy to help them with the daunting task of complying with tax rules in multiple jurisdictions," KPMG consultant Michael Burke said.

Also, 57% of the tax managers said their decision about where to locate e-commerce operations would be affected by the jurisdiction's tax policy.

■ The antitrust trial of Visa U.S.A. Inc. and MasterCard International Inc. began last week in New York, with the U.S. Department of Justice charging that the two credit-card networks don't compete with each other and have exclusionary ties with banks. Among other things, the government said the companies stifled innovation by jointly agreeing not to deploy smart cards throughout the U.S. more than a decade ago.

Foster City, Calif.-based Visa and Purchase, N.Y.-based MasterCard denied the charges and are expected to argue that they didn't deploy smart cards earlier because the enormous costs outweighed the returns. – *Mitch Betts*

Continued from page 1

Meat Exchange

headed by Peterson, the Right to Be Rural Coalition, has released excerpts from a letter Peterson received from Assistant U.S. Attorney Joel Klein in which the head of the DOJ's antitrust division confirmed that his group will examine the formation of the exchange. It is being developed by IBP Inc., Tyson Foods Inc., Gold Kist Inc., Farmland Industries Inc., Smithfield Foods Inc. and Cargill Inc., along with its subsidiary Excel Corp.

Tyson public relations manager Ed Nicholson said the six meat producers, which have combined sales of more than $40 billion per year, will cooperate with the government and are confident that the exchange will be allowed to go forward. "We are not anticipating that they will find anything they will object to," Nicholson said.

Exchanges Under Fire

The investigation into the meat exchange is the third case in which the government is looking into the potential antitrust implications nf an Internet venture being launched by competitors. The DOJ and the Federal Trade Commission (FTC) are investigating a business-to-business exchange being set up by the Big Three automakers. And the Senate Commerce Committee is examining an online ticketing Web site that's being developed with funding from the country's five largest airlines.

Peterson and his supporters — farmers from rural Minnesota — have charged that the meat exchange will lead to price fixing and force farmers to sell to just one company.

Nicholson denied that charge. "The site is going to be set up as a competitive site," he said. "All of the people in the business will be competing for customers." Nicholson called Peterson's assertion that the exchange represented an "OPEC of meat" a "mischaracterization."

In addition, Nicholson said a number of organizations and mechanisms are already in place to protect the public from price-fixing. He pointed to the Georgia Dock, which publishes poultry prices, and the Chicago Board of Trade as two prominent examples. Nicholson said the exchange is simply technology being superimposed on a structure to provide greater efficiency and economy.

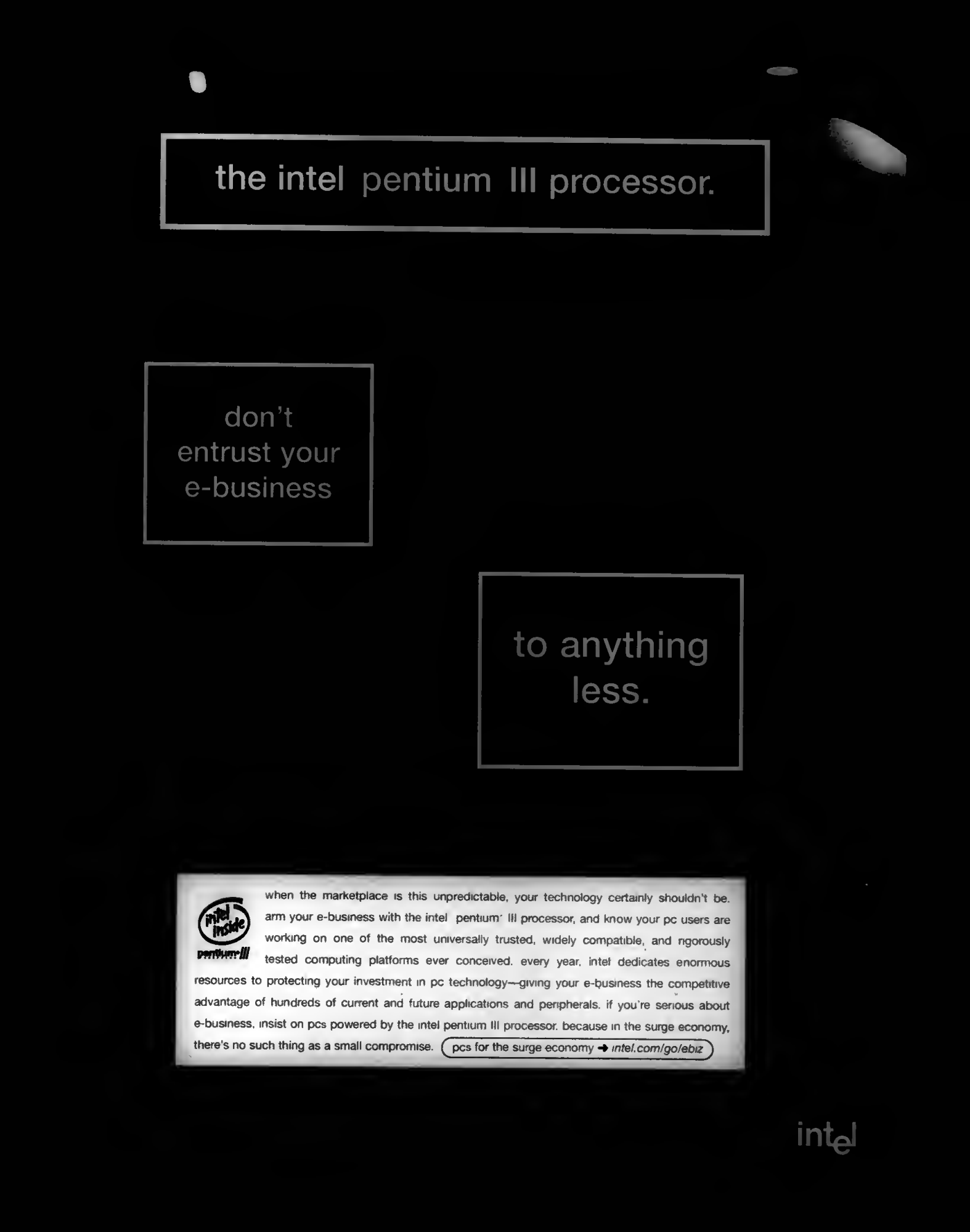
However, Peterson said he's convinced that it goes a lot further than that. "There is a feeling among people that there is a real bigness to the Internet and people are getting lost within e-commerce," he said. "There is this trend for vertical integration that cuts out the independent producer."

'Raw Power'

Peterson alleged that exchanges will hurt consumers, with prices becoming fixed because the exchanges represent "a concentration of raw power" in the hands of just a few companies and because they destroy competition.

"Everyone used to talk about Big Brother — this is the Big Company moving in, and they are finding every way to get your buying dollar. At some point, there has to be consumer choice," Peterson said. "It is pretty well a wash if we don't get a complete investigation of this. They might get too big for government to control, and then we're going to have some real problems in this country."

In addition to the various investigations the government has launched, the FTC has scheduled a two-day workshop on the antitrust implications of exchanges. The workshop is to be held June 29 and 30 in Washington and was expanded from an earlier plan of a one-day event "in light of the high level of public interest" in the topic, according to the FTC.


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Labor Shortage Aired At World IT Congress

Countries with well-educated workforces see opportunities for outside investment

BY PATRICK THIBODEAU
TAIPEI, TAIWAN

ELIOT NORMAN, a Richmond, Va.-based immigration attorney, arrived here last week for the World Congress on Information Technology, but like many of the 1,700 attendees, he didn't come for the scheduled speeches by people such as Bill Gates. Norman was here to drum up business.

"I'm prospecting," said Norman, who was searching out foreign companies that can help his U.S. clients with their high-tech worker needs or do offshore software development. His clients need both.

Within hours of arriving, Norman found a lead. He said he met with officials of an Asian company that may be able to fill a labor gap for a U.S. firm's operations in Malaysia. "This is only 24 hours for me, but I'm very upbeat," Norman said.

The worldwide IT labor skills shortage was a major issue at the three-day event. But it's a problem that is also creating opportunities for countries with educated workforces.

"We are looking for investors," said Juan Alvarado Lozada, dean of Ecuador's leading engineering university, Escuela Superior Politecnica Del Litoral in Guayaquil. "We have the labor force, and in our university, a good pool of engineers."



CONFERENCE ATTENDEES, shown here registering for the conference in Taipei, Taiwan, expressed concerns about global IT labor shortfall

Lozada said he doesn't see any reason why Ecuador can't duplicate the experience of Bangalore, India, which has become a major area for offshore software development.

Lozada's goal may not be a dream. Lester Thurow, an economist at MIT and one of the speakers at the conference, said he expects companies to broadeo their search for IT skills and talent throughout the world.

For instance, "Egypt is going to be ooe of those places that is going to be discovered just as Bangalore was 10 years ago," Thurow predicted, citing ooe country that he believes has the workforce to meet IT labor demands. "There are places in the world where IT skills are underutilized."

Even tiny couotries were trying to capture IT jobs at the conference.

Gregory Bowen, the minister of communications for Grenada, was at the conference to interest high-tech firms in his country as a potential solution to the IT labor shortage. He said high-tech companies in recent years have created 2,000 jobs on the island, which has a population of about 100,000.

IT companies have been attracted to Grenada by high educational levels and low wage rates, Bowen said. "We are hoping to make some networking contacts," he said.

Unfilled Positions

U.S. companies alone will seek to hire an additional 1.6 million workers this year but will be able to fill only half of those positions, according to a study this spring by the Arlington, Va.-based Information Technology Association of America.

Taiwan, for its part, is a major hardware IT producer. But the country is also preparing for e-commerce in an organized way. Taipei's city government has offered its 2.6 million residents free e-mail accounts and Internet training. Some 100,000 residents have set up e-mail accounts through the government program, officials said.

The congress is sponsored by the World Information Technology and Services Alliance, a Vienna, Va.-based organization that serves as an umbrella group for IT trade associations worldwide. It is the 12th meeting of the congress, which is held every two years.

Shaken, But Not Stirred

Neither a steady rain nor a Sunday predawn earthquake measuring 6.7 on the Richter scale, strong enough to rapidly sway hotel beds and wake guests, seemed to bother conference attendees. The earthquake caused two deaths, 36 injuries and numerous landslides in Taiwan, according to local English-language media. But there were no major structural failures.

The quake didn't shake Achilles Hatzinikos, CEO of Computer Logic SA in Athens, from his goal of finding business opportunities in Taiwan for his software development firm. The quake "is no problem for Greeks because we have many earthquakes in Greece," said Hatzinikos. ◗

Global IT Spending to Top $3 Trillion by 2004

More than $2 trillion was spent worldwide on information and communications technology last year, and the market is expected to continue to boom – topping $3 trillion by 2004, according to a study released last week by the World Information Technology and Services Alliance (WITSA).

Information and communications technology includes computer hardware, software, services, telecommunications and related expenditures. The study is based on data provided by International Data Corp. in Framingham, Mass., and was released at the World Congress of Information Technology in Taiwan last week.

In 1995, the information and communications technology market was just over $1.5 trillion.

The study also pointed to a shift in the areas of technology spending. While the hardware market grew by 6% last year, the software and services segments increased by 14% and 10%, respectively.

The shift represents the growing importance of the Internet economy, according to the study. Last year, Internet purchases totaled $130 billion. That amount is expected to increase to $2.5 trillion by 2004, according to the study.

North America led other world regions, with about $800 billion in information and communications spending; Europe was just under $600 billion.

The top 10 nations in per-capita spending, ranging from about $2,000 to $3,250, were Switzerland, Japan, the U.S., Sweden, Denmark, Singapore, Norway, the Netherlands, the U.K. and Australia.

WITSA, based in Vienna, Va., is an umbrella organization for IT trade associations worldwide.

– *Patrick Thibodeau*

Gates Vows Case Won't Stall Plans

TAIPEI, TAIWAN

Microsoft Corp. Chairman and Chief Software Architect Bill Gates last week called the government's antitrust case "an unfortunate distraction" that wouldn't keep the company from moving ahead rapidly on projects such as speech recognition. Gates predicted a court resolution of the government's antitrust lawsuit in about 12 months.

"Between now and then, it doesn't change anything that we are doing as a company," said Gates.

Gates was here for the World Congress on Information Technology, less than a week after U.S District Court Judge Thomas Penfield Jackson ordered the breakup of Microsoft.

At the congress, Gates outlined his company's plan to create very personalized, Internet-connected systems that use natural interfaces such as handwriting and speech to interact with and users.

"In this next-generation Windows, we will be investing more than three times what it cost to put a man on the moon," said Gates.

But Gates was in the unfortunate position of being in the warm-up spot for the next speaker, Robert Young, chairman of Durham, N.C.-based Linux vendor Red Hat Inc., who poked fun at Windows.

Innovation on the Internet "isn't going to work if we have to keep rebooting our systems," said Young, to the laughter of the attendees.

Listening to both talks was an audience of about 1,700 people from more than 60 countries. Among them was Chi-Hsing Yeh, a Taiwan government prosecutor who heads the Ministry of Justice's department of computer information. He said Gates' speech was "not very exciting," compared with Young's talk.

But Yeh was less certain about whether Microsoft should be broken up. As a big company, "Microsoft can beat other foreign software companies. I think [a] split into two companies is not good for U.S., but good for other countries," he said. – *Patrick Thibodeau*



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By scanning e-mail usage, you can monitor suspicious content and reduce e-mail volume, thereby boosting bandwidth.

SOME TEENAGERS HAVE AN EASIER TIME WRITING MALICIOUS CODE THAN GETTING DATES.

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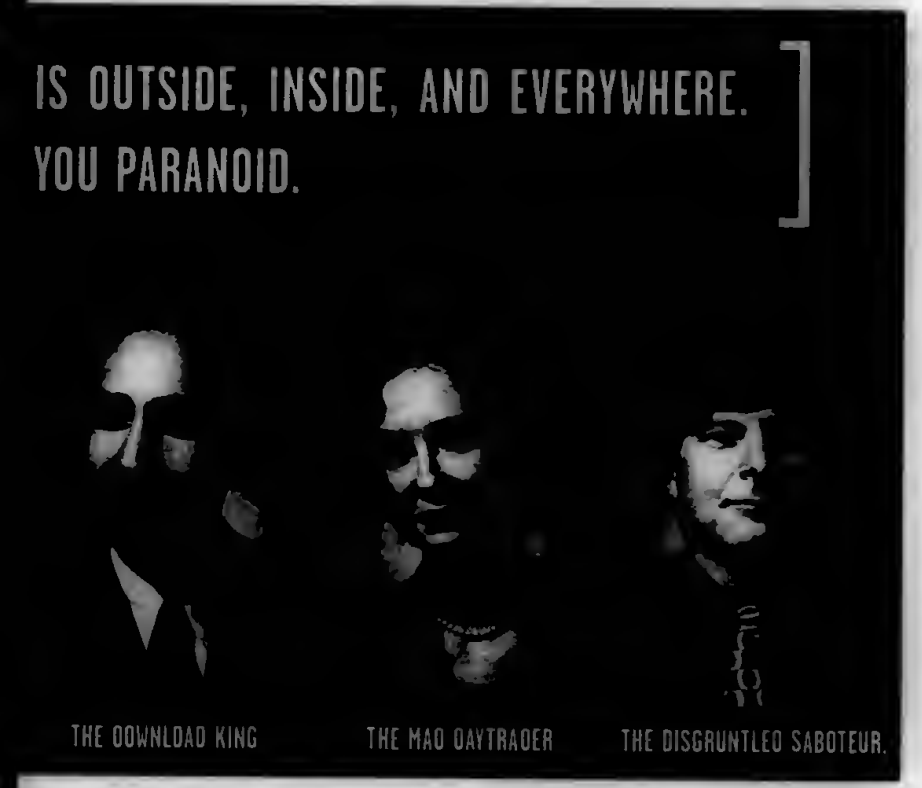


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malicious code. On the other hand, there are real ugly enemies out there.

Rogue employees and virtual terrorists bent on stealing company secrets, spreading malicious viruses, crashing servers, and potentially causing economic chaos.

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Hollywood Entertainment Reels In Its Dot-com Effort

After losing $55M in 18 months, Reel.com hands online video sales to third party

BY KATHLEEN OHLSON AND MICHAEL MEEHAN

THE NATION'S second-largest video-store chain has a big flop on its hands. It will essentially close its online store, turning over its online sales operations to a third party.

Hollywood Entertainment Corp. said last week that it will cease fulfilling sales at Reel.com Inc. after burning through $55 million during the past 18 months. After next week, Buy.com Inc. in Aliso Viejo, Calif., will process orders. Terms of the agreement weren't disclosed.

Wilsonville, Ore.-based Hollywood Entertainment earned $31.3 million in sales from its video stores last year, while its Emeryville, Calif.-based Reel.com unit lost $51.3 million.

"Hollywood Entertainment will [now] see profits instead of losses," said David Martin, Hollywood Entertainment's chief financial officer. The company will keep Reel.com's content, reviews, interviews, daily news and featured articles, "but we'll take away all the [financial] losses that went with e-commerce," he said.

Failed Endeavors

The chain sought to take Reel.com public to raise capital last December and pursued private placement and other avenues, all of which failed.

Analysts said Reel.com also fell victim to Wall Street, which at first overlooked losses at many dot-coms as companies expanded market share.

"Hollywood Entertainment was hemorrhaging financially, and its losses weren't decreasing," said Alan Alper, an analyst at Gomez Advisors Inc., an online business consulting firm in Lincoln, Mass. During its first quarter, Hollywood Entertainment's video unit reported $321 million in revenue and $11.5 million in profits. Reel.com reported $13.8 million in revenue and a pretax loss of $18.1 million.

David Cooperstein, an analyst at Forrester Research Inc. in Cambridge, Mass., said Hollywood Entertainment didn't have a wide enough product offering to thrive online.

"I think people were actually just using [Reel.com] for research more than anything else," Cooperstein said.

Ken Cassar, an analyst at Jupiter Communications Inc. in New York, said Hollywood Entertainment bought Reel.com in 1998 to get online but didn't switch Reel.com to its brand name, losing a marketing opportunity.

Branding is one advantage not lost on Best Buy Co. in Eden Prairie, Minn., which last week expanded its online offerings from videos and music to include the home electronics available in its 350 stores.

- Reel.com is founded in September 1996 as an online database.
- Site launches in April 1997.
- Reel.com is sold to Hollywood Entertainment in 1998 for $100 million. Hollywood files for Reel.com initial public offering status.
- Hollywood ceases online sales at Reel.com on June 12. Reel.com will continue to host content, but Buy.com will take over the e-commerce services.

Best Buy spokeswoman Laurie Bauer said the BestBuy.com Inc. site will provide product details and entertainment reviews to try to lure customers who may buy online or shop at one of the company's brick-and-mortar stores. The company sees its Web site and physical stores "working in tandem," she added.

Web Hope Springs Eternal

Harry Wolhandler, an analyst at ActivMedia Research LLC in Peterborough, N.H., said Best Buy's deliberate approach to online retailing was a prudent one, given its widespread brick-and-mortar presence. "Companies like Best Buy essentially come online and cherry-pick," he said. "They don't have to be first, because they've got brand-name [recognition]. All they had to do is learn the game."

But not all is lost with Reel.com, Cassar said. Hollywood Entertainment may try setting up reservations for video rentals on the Web so customers can pick up videos on the way home, he added.

Net Bond Marketplace Going to Prime Time

BondBook, ValuBond aim to catch up with online stock trading

BY MARIA TROMBLY

Online bond trading has been lagging significantly behind online stock trading, but two new ventures suggest the gap might soon start to close.

Earlier this month, The Goldman Sachs Group Inc., Merrill Lynch & Co. and Morgan Stanley Dean Witter & Co. joined forces to launch BondBook, an online exchange for corporate and municipal bond trades. Only days earlier, Charles Schwab & Co. announced a partnership with ValuBond Inc. to offer a variety of bonds to its retail investors.

Currently, only 7% or 8% of the bond market is online, said Larry Tabb, an analyst at Needham, Mass.-based TowerGroup.

"We expect that to increase," he said. "We anticipate that within the next year or two, it will be 40% or 50%."

However, Tabb warned that it's still to early to tell who the major players will be in the bond arena.

"It will take a year or two for it all to shake out," he said.

Unique Alliance

Schwab's alliance with ValuBond is unlike most other online bond trading platforms in that it targets individual investors, not institutional investors or professional traders.

The ValuBond site (www.*valubond.com*) will launch next month, according to ValuBond President Lisa Edwards. The site will offer municipal bonds, a wide selection of corporate bonds, agency debt, convertible bonds and other hybrid securities.

In addition, the site will offer tools such as portfolio analysis, calculators and tutorials.

Most other players are targeting institutional investors and broker-dealers.

New York-based TradeWeb LLC, for example, which, according to Tabb, is the most successful of the online bond marketplaces so far, is backed by 15 bond dealers, including some of the largest names on Wall Street. TradeWeb focuses on U.S. treasury bonds and was founded in January 1998.

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Convertible bonds: Corporate bonds that can be traded for company stock

Hybrid securities: A cross between a bond and a share of stock, which can usually be bought at smaller minimum amounts than bonds, that have longer maturation periods and that can be more easily traded

Diversify, Diversify

The BondBook founders said they will offer a greater selection of bonds than TradeWeb.

At present, most corporate bond trading is done by telephone, with brokers controlling — and facilitating — the entire process.

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BondBook will begin trading U.S. corporate bonds, high-yield (or junk) bonds and municipal bonds in the fourth quarter, he said.

Merrill Lynch is also one of the backers of the MuniCenter, the first online exchange for municipal bonds, which went live at the end of last month.

"They're not sure which of these marketplaces is going to succeed, so they're looking to back a whole host of players," Tabb said.

Tabb said the fact that Merrill Lynch — as well as some of the other brokerages — are backing multiple platforms is a sign that the distribution arms are separating from the product-creation arms of the brokerage industry.

"When that occurs, then, from the product standpoint, you need to trade with as many counterparties and as many systems as possible," he said. "If it comes through BondBook, that's great. If it comes through TradeWeb, it's great. They're moving away from trading through their own proprietary channels, their own sales systems."

Hollywood Entertainment Reels In Its Dot-com Effort

After losing $55M in 18 months, Reel.com hands online video sales to third party

BY KATHLEEN ONLSON AND MICHAEL MEEHAN

THE NATION'S second-largest video-store chain has a big flop on its hands. It will essentially close its online store, turning over its online sales operations to a third party.

Hollywood Entertainment Corp. said last week that it will cease fulfilling sales at Reel.com Inc. after burning through $55 million during the past 18 months. After next week, Buy.com Inc. in Aliso Viejo, Calif., will process orders. Terms of the agreement weren't disclosed.

Wilsonville, Ore.-based Hollywood Entertainment earned $31.3 million in sales from its video stores last year, while its Emeryville, Calif.-based Reel.com unit lost $51.3 million.

"Hollywood Entertainment will [now] see profits instead of losses," said David Martin, Hollywood Entertainment's chief financial officer. The company will keep Reel.com's content, reviews, interviews, daily news and featured articles, "but we'll take away all the [financial] losses that went with e-commerce," he said.

Failed Endeavors

The chain sought to take Reel.com public to raise capital last December and pursued private placement and other avenues, all of which failed.

Analysts said Reel.com also fell victim to Wall Street, which at first overlooked losses at many dot-coms as companies expanded market share.

"Hollywood Entertainment was hemorrhaging financially, and its losses weren't decreasing," said Alan Alper, an analyst at Gomez Advisors Inc., an online business consulting firm in Lincoln, Mass. During its first quarter, Hollywood Entertainment's video unit reported $321 million in revenue and $11.5 million in profits. Reel.com reported $13.8 million in revenue and a pretax loss of $18.1 million.

David Cooperstein, an analyst at Forrester Research Inc. in Cambridge, Mass., said Hollywood Entertainment didn't have a wide enough product offering to thrive online.

"I think people were actually just using [Reel.com] for research more than anything else," Cooperstein said.

Ken Cassar, an analyst at Jupiter Communications Inc. in New York, said Hollywood Entertainment bought Reel.com in 1998 to get online but didn't switch Reel.com to its brand name, losing a marketing opportunity.

Branding is one advantage not lost on Best Buy Co. in Eden Prairie, Minn., which last week expanded its online offerings from videos and music to include the home electronics available in its 350 stores.

- Reel.com is founded in September 1996 as an online database.
- Site launches in April 1997.
- Reel.com is sold to Hollywood Entertainment in 1998 for $100 million. Hollywood files for Reel.com initial public offering status.
- Hollywood ceases online sales at Reel.com on June 12. Reel.com will continue to host content, but Buy.com will take over the e-commerce services.

Best Buy spokeswoman Laurie Bauer said the BestBuy.com Inc. site will provide product details and entertainment reviews to try to lure customers who may buy online or shop at one of the company's brick-and-mortar stores. The company sees its Web site and physical stores "working in tandem," she added.

Web Hope Springs Eternal

Harry Wolhandler, an analyst at ActivMedia Research LLC in Peterborough, N.H., said Best Buy's deliberate approach to online retailing was a prudent one, given its widespread brick-and-mortar presence. "Companies like Best Buy essentially come online and cherry-pick," he said. "They don't have to be first, because they've got brand-name [recognition]. All they had to do is learn the game."

But not all is lost with Reel.com, Cassar said. Hollywood Entertainment may try setting up reservations for video rentals on the Web so customers can pick up videos on the way home, he added.

Net Bond Marketplace Going to Prime Time

BondBook, ValuBond aim to catch up with online stock trading

BY MARIA TROMBLY

Online bond trading has been lagging significantly behind online stock trading, but two new ventures suggest the gap might soon start to close.

Earlier this month, The Goldman Sachs Group Inc., Merrill Lynch & Co. and Morgan Stanley Dean Witter & Co. joined forces to launch BondBook, an online exchange for corporate and municipal bond trades. Only days earlier, Charles Schwab & Co. announced a partnership with ValuBond Inc. to offer a variety of bonds to its retail investors.

Currently, only 7% or 8% of the bond market is online, said Larry Tabb, an analyst at Needham, Mass.-based TowerGroup. "We expect that to increase," he said. "We anticipate that within the next year or two, it will be 40% or 50%."

However, Tabb warned that it's still to early to tell who the major players will be in the bond arena.

"It will take a year or two for it all to shake out," he said.

Unique Alliance

Schwab's alliance with ValuBond is unlike most other online bond trading platforms in that it targets individual investors, not institutional investors or professional traders.

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David Warthen, Chief Technology Officer, **Ask Jeeves**

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Service Beats Price in Web Shopping, MIT Study Finds

BY MELISSA SOLOMON
SAN JOSE

The Internet isn't necessarily the great price equalizer it was thought to be, according to a recent study.

While search tools on the Web make it easier for shoppers to compare prices, online costs fluctuate even more than they do in the brick-and-mortar world, said Erik Brynjolfsson, associate professor at MIT's Sloan School of Management and co-director of the Center for eBusiness@MIT in Cambridge, Mass. Customers on the Web are still willing to pay more for high-quality service and innovation, he said at the eBusiness Conference and Expo here last week.

"It's not the case that the Internet always destroys existing business practices," he said.

Brynjolfsson shared the results of a study he led at MIT that analyzed purchases made through online price intermediaries, also known as shop bots. These sites search the Web for specific products, then give consumers lists of sellers and their prices.

Only 47% of consumers surveyed said they bought from the lowest-price seller. In fact, Brynjolfsson said, price was the least important factor.

Customers most often choose sites they have previously visited, said Brynjolfsson. The next most important factor was advertising and name recognition, followed by shipping time and price.

Responsiveness Is Key

The key, he said, is for firms to take their successful traditional business practices, determine which can be reshaped for the Internet and devise an evolving business plan that responds to changes in the market as they occur, such as the growing demand for wireless e-commerce.

Richard Owen, CEO of San Mateo, Calif.-based AvantGo Inc., said the Web hasn't changed the rules of business — it has just created "a window" on companies' services.

E-commerce "is shining a torch" onto the business practices of companies, he said. "Opening up your windows" to customers simply forces companies to improve their processes.

The same holds true for business-to-business markets, said Brynjolfsson. Often, companies turn to the supplier with the best service.

Jane M. Kirkland, vice president and CIO of Pittsburgh-based FreeMarkets Inc., a business-to-business online marketplace serving more than 100 vertical markets, said there's room for several business-to-business exchanges within each industry.

But, she added, as long as customers have the freedom to try different exchanges, "the volume will migrate to the marketplaces that work best."

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CITRIX CEO Mark Templeton: Penetration of large accounts and new markets was disappointing

Citrix Takes A Beating on Wall Street

BY JAMES COPE

Wall Street darling Citrix Systems Inc., a Fort Lauderdale, Fla.-based maker of application server software, last week announced that its second-quarter profits would be well below expectations. The warning drove the price of the company's stock down about 50% to a 52-week low of $22.25 at the close of trading June 12.

Citrix — which saw its annual sales shoot up 62% to $403.3 million last year — said revenue growth in this year's second quarter may reach only 11%. The company expects second-quarter revenue to come in between $105 million and $110 million, compared with $94.4 million in the same three months last year.

Citrix President and CEO Mark Templeton said profits for the quarter are likely to range from $16 million to $20 million, down from $27.8 million in the year-ago quarter.

Citrix blamed several factors, including a slower-than-expected expansion of its business within large corporate accounts. Sales in Asia also were below expectations, and the company said a transition to a new software licensing model is having a short-term negative impact on its revenue.

Templeton said in a statement that Citrix executives "are disappointed in the rate at which we are penetrating large enterprise accounts and new geographic markets." But, he added, the company remains "optimistic about the opportunities presented in the application serving market."

Microsoft Moves to Per-Processor Pricing

Will help companies figure costs better

BY DOMINIQUE DECKMYN

IN WHAT USERS and analysts consider an overdue move, Microsoft Corp. last week said it will offer per-processor pricing for some of its upcoming server products, including SQL Server 2000.

Microsoft has traditionally priced its server products on a per-seat basis, requiring corporate customers to track their usage of the software and buy additional Client Access Licenses when needed.

Per-seat licensing made sense when there was a fixed number of people in the enterprise, said Joe Clabby, an analyst at Aberdeen Group Inc. in Boston. Internet computing makes that model difficult because it's often impossible to know how many people are accessing an application.

With per-seat licensing, users often didn't know if they were in compliance, said Barry Goffe, group manager for Windows DNA at Microsoft.

Even companies that use the software inside a firewall applaud the new pricing model.

"It's hard to keep track of how many people use a product," said John Loo, director of systems network engineering at Los Angeles-based network E! Entertainment Television, a subsidiary of Comcast Corp. Per-processor pricing would save a lot of time, said Loo.

The top-tier database vendors have already moved to per-processor pricing, said Terilyn Palanca, an analyst at Giga Information Group Inc. in Cambridge, Mass. Microsoft needed to make the same move that Oracle Corp. and IBM have made, she said. The new pricing could give users a more predictable price and could help SQL Server gain more credibility, she added.

The new pricing model will apply to most server products that are a part of Microsoft's forthcoming DNA 2000 lineup, including SQL Server 2000, BizTalk Server 2000 and Commerce Server 2000. Exchange 2000 will continue to be licensed per seat. Pricing for Windows 2000 Server remains unchanged.

By the Numbers

SQL Server 2000, which will ship later this year, will be available under the new per-processor and the old per-seat pricing:

- **Per-processor pricing:** $4,999 per processor for the standard version and $19,999 for the enterprise edition
- **Per-seat pricing:** $1,489 for the standard edition with five users and $11,099 for the enterprise edition with 25 users

Intel CEO, CIO Talk E-Business

Company wants to take all orders online

BY MARK HALL
SANTA CLARA, CALIF

Craig Barrett, CEO of Intel Corp., told *Computerworld* last week that he wants the company to be a "100% e-business." With $1 billion per month in orders being booked online today, his company is just shy of halfway to that goal. He said he expects it to be 90% there by year's end.

Making the plan a reality is the responsibility of Doug Busch, Intel's CIO. In the process, Busch said, "IT has changed the culture of the company."



INTEL CEO Craig Barrett wants a "100% e-business"

For example, Intel is known for its global manufacturing muscle. To help keep that edge, the company has added a webcast to its traditional annual U.S. conference, saving time for international and other travelers and cutting by three-fourths the number of Intel manufacturing employees — 3,000 — who normally trek to the meeting.

Busch said he has also integrated parts of his organization into the company's various business lines that are trying to exploit the Internet. Members of Busch's staff work with line managers to determine how to design and implement business objectives around information technology capabilities.

"We have overlapping knowledge," he said.

Although Barrett said he considers Intel's "100% e-business" plan a strategic goal, it's not part of his overarching goal to grow revenue 15% to 20% per year to meet Wall Street's lofty expectations.

"It's not a new channel to get new customers," he said.

Rather, Busch said, "It breaks down the boundaries between business and technology settings." He noted that customer service representatives who once took fax and phone orders from Intel customers are now trained to work closely with them, monitoring their online orders and tailoring product shipments to customers' inventory needs.

With more than 10,000 suppliers and customers accessing the online ordering system, Busch said, security is a top priority, but not just for Intel.

"Security should be viewed as a public health issue," said Intel's CIO. "You need to protect your own systems so as to not be the launching point to infect others."

BRIEFS

Xircom, Cisco in Wireless LAN Pact

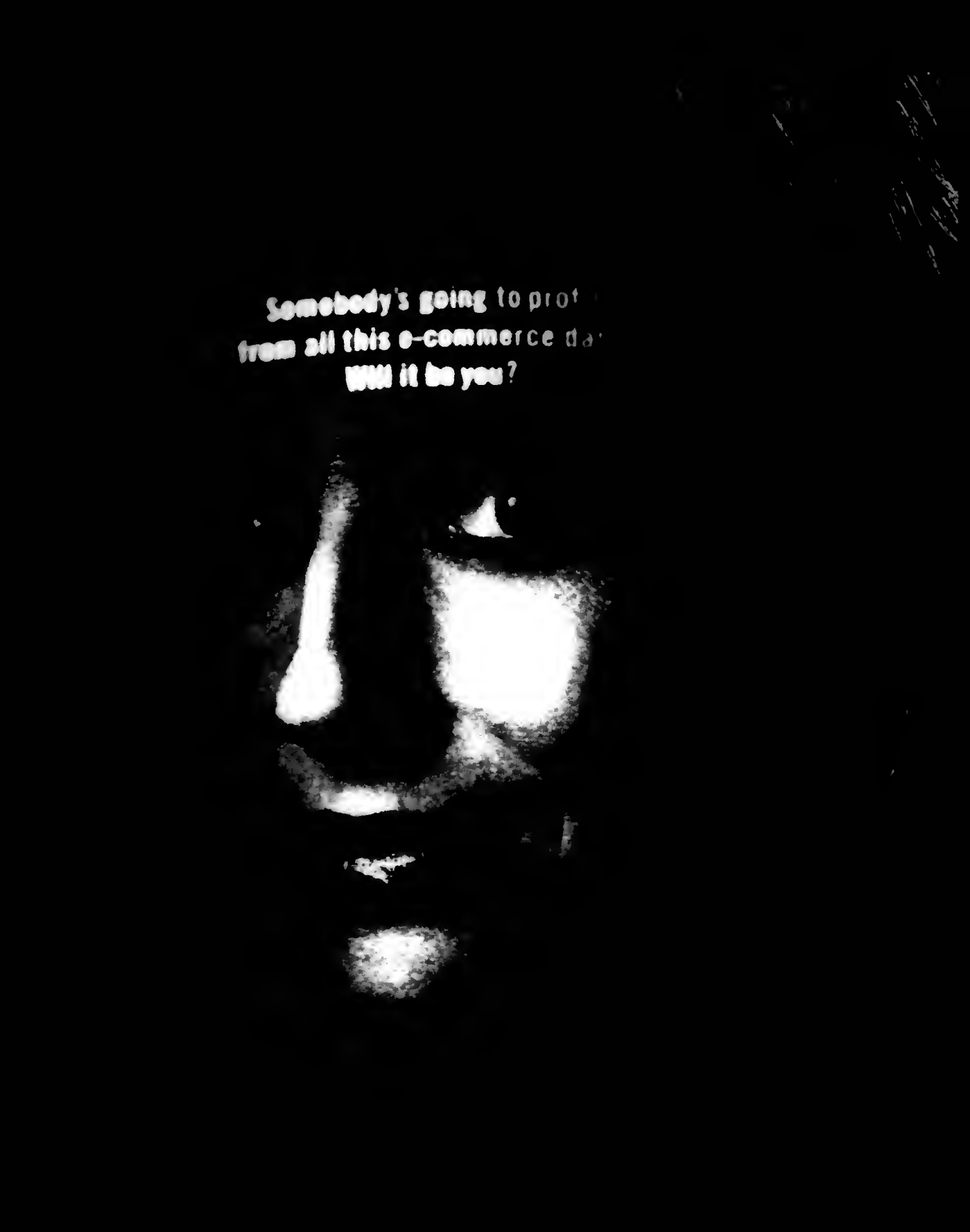
Xircom Inc. in Thousand Oaks, Calif., last week announced an alliance with Cisco Systems Inc. in San Jose to develop and market mobile wireless LAN adapters. Wireless LAN access allows users with laptops, notebooks and handheld devices to move freely within a building or campus environment while maintaining an uninterrupted connection. Xircom last week also acquired Omnipoint Technologies Inc., a subsidiary of Bellevue, Wash.-based VoiceStream Wireless Corp. VoiceStream will be a minority investor. With the acquisition, Xircom gains wide-area network, Global System for Mobile communications and General Packet Radio Service products and technology.

3Com Launching Broadband Services

Santa Clara, Calif.-based 3Com Corp. this week is launching a networking system that uses existing copper-wire telephone lines to provide value-added broadband Ethernet services to hotels, multitenant offices and apartment and condominium complexes. The new Visitor Community Network system will carry voice, video and data packets over existing copper wires at speeds of 10M bit/sec. for up to 4,000 feet without any infrastructure upgrades and without adding software to the user's desktop, according to 3Com officials.

Toysrus.com Moves To Balance Business

In an effort to attract new customers to its Web site and gear up for this year's holiday shopping season, Toysrus.com has inked a deal with Nickelodeon to launch a Nickelodeon boutique channel on its Web site. In addition, Toysrus.com, a division of Paramus, N.J.-based Toys R Us Inc., will acquire the inventory of Red Rocket, owned by New York-based Viacom Inc., which also owns Nickelodeon. Red Rocket closed in May. John Barbour, CEO of Toysrus.com, said his company decided to team up with Nickelodeon in part because of its loyal audience – Internet-savvy children.


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MARYFRAN JOHNSON

The IT title wave

MY PHONE RANG THE OTHER DAY with good news from a friend and longtime CIO, who had just started a new job. Not as a CIO, but as chief operating officer at a multibillion-dollar utility company. That same day, I happened to spot a Gartner Group study of 1,400 CIOs. The analysts examined various roles CIOs play these days as e-business leaders and boardroom-level executives.



MARYFRAN JOHNSON is editor in chief of *Computerworld*. You can contact her at maryfran_johnson@computerworld.com.

What the Gartner report overlooked was that for top information technology positions, titles are increasingly meaningless. The pigeonholes just don't fit anymore. CIO? CTO? COO? Who cares? At *Computerworld*'s Premier 100 Conference this week in Palm Desert, Calif., tech-savvy executives with ever-widening titles and responsibilities will be in attendance: senior vice presidents, chief technology officers, IT VPs, CIOs, dot-com CEOs. They're all IT leaders.

I talked recently with Charlie Feld, formerly CIO and now "e-leader" at Delta Air Lines — a quirky title change that reflects what really matters in 21st-century business. In Feld's view, the top technologist role "is just huge, from managing vendors to managing the executive committee to managing the user community. It takes a tremendous amount of vision, communication skills, energy and leadership."

About the only things moving faster than the speed of business change these days are the responsibilities of the top technologists.

Consider Doug Busch, vice president and director of IT at $30 billion Intel Corp. He runs a 3,400-person IT operation with a $700 million budget to support 70,000 employees, who create more than 3 million e-mails per day and generate more than 143,000 hours per month of teleconferencing. He's also responsible for the infrastructure underlying the more than $1 billion in e-business transactions Intel clocks monthly.

Busch is a true believer in the partnership of business and IT. He sees a direct link between the agility and success of companies today and how well their business and tech operations work together. Busch says his peers agree on what IT leaders should be doing: "Stretching to keep up with customers, dealing with security and privacy issues and managing e-business partnerships."

Sounds more like a CEO to me. Not that that matters. . . .



ERIK SHERMAN

Patenting Web can sow more harm than good

IT'S BEEN MONTHS SINCE Amazon.com started legal action against Barnes & Noble over Amazon's patented 1-Click order feature, and almost as long since people in the technology industry, from Tim O'Reilly, founder and president of publishing house O'Reilly and Associates, to stalwart Richard Stallman, software freedom booster, started crying foul.

In public letters, press announcements and newsgroup postings, many criticized the U.S. Patent Office for granting protection for a Web site feature, as well as Amazon's use of the patent in a lawsuit.



ERIK SHERMAN is a writer in Marshfield, Mass., who regularly covers technology and business issues. Contact him at esherman@reporters.net.

Things seem to have calmed on the surface, with O'Reilly and Amazon Chairman and CEO Jeff Bezos exchanging a string of letters about the nature of patents, and no publicly announced filings of new suits wafting down from Amazon's headquarters in Seattle.

Imagine, for a moment, that through some divine intervention of the digital deities, people like O'Reilly suddenly saw the desperate need for patenting Web features or that people like Bezos saw the error of their ways and swore off sending their lawyers out to bave their teetb sharpened. Still missing in the debate would be an acknowledgment that any business focusing so closely on patenting business processes as expressed by a Web site is grasping at the intangible and inviting trouble.

Since this country's founding, many companies have made good use of patents, building solid products and gaining a time advantage in getting them to market. But for decades, companies have repeatedly fallen prey to the "silver bullet" syndrome. Under this view of business, when a problem appears, a slim software package riding on a white horse dismounts, and faster than you can say, "Blam!" the company dispatches it with a single installation. There's something alluring about the idea that an application can bring such benefits to a company but, unfortunately, very little that's realistic. Almost always, a company finds that the software is, at best, a tool that must be used by a properly prepared organization. If smart business practices are nowhere to be found, neither is the rescue at high noon.

With a Web patent, a company holds tight to the technical implementation of how it manages a commoo business process such as taking an order. Instead of honing its employees' underlying ability to efficiently ship a product, satisfy a customer or clear up a complaint, the company brandishes a piece of software as both sword and shield. The action is ultimately a dehumanization of business, because it's saying that people don't count — only applications do. Yet people are the only source of new ideas and inspiration that can make businesses successful in the long run. By embracing a dependence on the silver bullet rather than on the attitude of fierce competition and excellence in operations, companies become weak, complacent and foolhardy.

There is danger in patenting the Web, but the greatest peril is ultimately to those who do so. ◗

MOHAN BABU

A foreigner's plea: Make it easier for us to work in U.S.

PORTUGUESE EXPLORER Vasco da Gama faced a diplomatic dilemma when he landed in southern India in the late 15th century. A local king didn't want foreigners to come in and disturb the social equilibrium. He sent his emissary to da Gama's camp with a symbolic gesture: a glass brimming with milk. This symbolized that Indian society was full and content and didn't want anyone to come in and change the balance. Da Gama thought for a moment, tben asked his aide to get a spoonful of sugar and add it to tbe milk. On hearing this, the Indian king realized that da Gama and his troops would dissolve into their society and add sweetness witbout disrupting it. The king immediately rushed over and embraced da Gama and his troops.



MOHAN BABU is an IT consultant and native of India who is working in the U.S. on an H-1B visa. Contact him at [redacted]

There's a similar story in today's informatinn technology wnrkforce: Indians are reaching out to the far corners of the globe, including the U.S., and adding sweetness tn the already full glasses of milk without spilling a drop.

Indians fnrm a sizable part of the group of high-tech professinnals who are issued temporary H-1B visas to work in the U.S. The Immigration and Naturalization Service (INS) issues about 50,000 such visas per year to Indians (out of a total of 195,000 this year).

When the H-1B visa was created, it was thought of as a stopgap solution to fix the "temporary" shortage of IT professionals. A person with an H-1B visa can work in the U.S. for only six years, tben he must leave tbe country unless he applies for and receives a green card, which gives a foreigner the right to live and work in the U.S. witbout restrictions. An H-1B visa isn't easily transferable, and a professional who comes to the U.S. on one can't just change employers.

In the dynamic world of IT, where mergers, acquisitions and downsizing are de rigueur, being on an H-1B visa puts an IT professional in a precarious position. He can't look around for better opportunities in the open market and is almost bonded to his employer.

Many Indians who come to the U.S. on H-1B visas file for green cards. But the process to get one is complex. An applicant must go through a oumber of stages that can last four to six years before being approved by the INS. During that time, the employee is dependent nn the benevolence of the company that filed for his visa application. Like an H-1B, the green-card application is almost impossible to transfer, and the employee has to withdraw it if he loses his job

Many foreign-born professinnals leave behind their families and roots in search of better opportunities, and are helping the U.S. economy. Being here on H-1B visas bolsters the fact that they're technologically competent and needed. The least the U.S. can do for them is to remove the swords of Damocles that dangle above their beads by giving them tbe freedom to live and work without fearing tbe uncertainties of corporate America.

There are a number of bills before Congress that, if passed, would alleviate the plight of H-1B workers by easing the green-card application process. Many executives at major IT companies favor increasing the number of H-1B and immigrant visas.

Given the dynamic nature of today's IT world, continuing to have a backlog in green-card processing and an immovable cap on the number of H-1B visas might slow the stellar economic growth that we've seen over the past decade.

So, would it be asking too much to make it easier to obtain an H-1B visa or a green card? ◗

READERS' LETTERS

High-tech immigration policy rankles many

I TOTALLY DISAGREE with Andrew Wilson's May 22 column, "Visa Bill a Relief for IT Managers." As an AS/400 programmer and a U.S. citizen, I shouldn't have to worry about losing my position because my company could hire an H-1B immigrant at a much lower cost. This is a rude form of carpetbagging that would never happen if programmers were nrganized like the United Autn Workers.

To call these visas "temporary" insults our intelligeoce. Most of these people have no intention of leaving this country. So what do we gain? More social problems associated with uncontrolled immigration and wage suppression by forcing Americans to compete with foreign workers.

Grant Kenny
Freehold, N.J.

ANDREW WILSON misses the point of the H-1B debate. He believes the Information Technology Association of America's assertion that there is a shortage of IT professionals. The ITAA is pushing to get the H-1B cap increased and isn't an unbiased source. According to John Fraser, deputy administrator of the U.S. Department nf Labor's Wage and Hour Division in Washington, "There is no discernible indicator in unemployment and wage data consistent with a labor shortage."

The economic boom won't turn to bust if the H-1B cap isn't increased. It seems amazing that an indostry as successful as high tech has been without the government's help must now have the government's help to keep the entire economy from going bust.

I know several individuals with H-1B visas who have gone on to get green cards and even become U.S. citizens. They were indentured servants, except that indentured servants usually have an agreement that wben their servitude is up, they can stay. Why don't we, as a nation, admit that large corporations want cheap labor and are willing to take advantage of others to get it, and that politicians will let them have it as long as no one else is heard?

Tad Stephens
Birdwell Consulting Services
Southlake, Texas
tad@birdwellconsulting.com

ISN'T IT ABSURD that the Immigration and Naturalization Service has an admittedly inefficient, outdated system for processing green-card applications, while the people who are waiting to get the right tn work here are the ones with the skills to replace that INS system ["Backlog Keeps Visas on Shelf," Page One, June 5]? Doesn't it seem worth exploring the possibility of organizing a volunteer, Linux-like network of developers waiting for their green cards to write the replacement system?

Bruce Allen
Left Brain Inc.
Irving, Texas

Piracy damage estimates outrageous

JUST EXACTLY WHAT is the factual basis for the claim of $59 billion lost to software piracy over the past five years ["Corporate Software Piracy Tops $12B," News, May 29]? The claim seems rather outrageous and is perhaps slanted to gain some legislative action that may (as usual) be massive overkill once the actual facts are known. To put the question another way, who's counting, and what are they counting? I assume that software pirates aren't being polled.

Jim H. Slotter
Lansdale, Pa.

More Letters, page 36

COMPUTERWORLD welcomes comments from its readers. Letters shouldn't exceed 200 words and should be addressed to Jamie Eckle, letters editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701 Fax (508) 879-4843. Internet: letters@computerworld.com. Include an address and phone number for immediate verification.

JOHN GANTZ

Software 'plumbing' will make data flow more easily

MY ADMINISTRATIVE assistant's husband is a plumber. She drives a better car than I drive. They have a summer hnme nn Cape Cod. I have a Timberline tent. There are big bucks in plumbing.

So, too, will there be big bucks in a new kind nf software "plumbing," called application integration software by my colleagues at IDC. This is software specially designed to enable disparate applications that were independently developed and deployed to interoperate. It's designed to tie back-end and front-office applications together, to link ERP and CRM systems and, someday, all the different IT systems in one supply chain.



JOHN GANTZ is a senior vice president at International Data Corp. in Framingham, Mass. Contact him at jgantz@idc.com.

I know IT departments routinely integrate applications as part nf their deployments of new systems. And a whole branch of the IT services industry does nnthing but application integration.

But this integration is different. Today's integration is generally from a single-source application to a single-target applicatinn. Or between a small handful of applications. The result doesn't scale, is hard to maintain and isn't extensible.

This software works more in a hub-spoke fasbion, more or less sn depending on how the integration is implemented. The most sophisticated tools are message-oriented, where special middleware sits in a hub and manages a database of business rules associated with all the different applications — the spokes — that need to interoperate.

IBM, Tibco, BEA Systems and a bost of other vendors are pushing the envelope here. The simplest form of application integration works at the point of access, with screen scraping and terminal emulation rudimentary examples. This kind of software would, for example, take an input from an e-commerce portal and simultaneously send messages or inputs to multiple legacy systems (and gather responses). Attachmate, eGrabber and Hummingbird all work in this space.

A third type of integration can take place at a data integration hub that sits between the data sets intrinsic to different applications, sort of a marriage between data warehousing and data extraction software. Vendnrs here include Constellar, Saga, Cohera and many others. (E-mail me for a more comprehensive list of vendors.)

I'm telling you all this not because plumbing is exciting, but because plumbing breakdowns are. In the coming era of e-business and e-services, where the solutions we want to deploy have to span not just enterprises but also ad hoc consortia, such as Web marketplaces owned by competing companies, I don't see how we can go *without* some kind of unifying software. And the big applications vendors don't seem keen on developing tools or features that allow their software to interoperate with competitive products, so we're stuck with this growing third-party market.

You should probably be looking at this stuff now. It's going to be easy to pick which vendor or approach will be best, and there will be a learning curve associated with designing an application integration architecture. But any onc of tbose packages will probably be better than band-rolling integration tools or code. If you buy one of these packages, you won't be alone. A worldwide market of $800 million last year is expected to grow more than tenfold by 2004, to almost $9 billion. The bandwagon is rolling.

WILLIAM M. ULRICH

Multidimensional integration a key to digital growth

"THE DEGREE TO which a company can digitize its processes will affect its performance — that's where the heart and soul of productivity is coming from."

This message comes from a recent report by the University of Texas at Austin, funded by Cisco Systems Inc. The report found that companies integrating tbe Internet into their operations were two and a half times more likely to see productivity gains and more than two and a half times more likely to see market-share growth.



WILLIAM M. ULRICH is a management consultant and president of Tactical Strategy Group Inc. Contact him at www.systemstransformation.com.

But how can most companies, weighed down by long-standing compartmentalized infrastructures, partitioned processes, redundant data structures and fragmented systems meet this challenge? To fully integrate tbe power of the Internet into an enterprise, organizations must embrace a multidimensional integration strategy.

Compartmentalized organizational structures were established long before tbe advent of the Internet and computers themselves. Existing business practices, data structures and computer systems — even those systems developed during the past decade — reflect tbe compartmentalized business units found in most organizations. Every aspect of today's enterprise, including manual processes and automated systems, is a monument to an era when integration was a nonissue and segregation was the norm. Tackling this challenge requires a multidimensional approach, which examines integration from business and technical perspectives at an enterprise level.

Multidimensional integration goes beyond the cnrrent practice of linking Web-based front ends to legacy systems and data structures and tackles the challenge of integrating infrastructures, processes and systems with the new world of the Internet. It requires taking a holistic look at tbe organizational structures, processes, data, systems and external relationships that define a business. Tackling this issue piecemeal or purely from a user-interface perspective will stall efforts to fully integrate the Internet into tbe enterprise.

For example, creating an e-commerce site that can access back-end order processing, procurement and inventory systems through message queuing or related technologies provides the first generation of integration. But while delivering some near-term value by providing Web-based users with the illusion of integration, it doesn't address the integration of segregated back-end business processes, data structures or systems. Even more problematic is that first-generation integration projects don't recognize the need to address the line-of-business compartmentalization that gave rise to these fragmented processes, data structures and systems in the first place.

The prodnctivity numbers cited in the University of Texas report legitimize the momentum the Internet has gained in corporations around the glnbe. And recognizing the need to integrate the Internet with existing processes, data, systems and supply chains is a step in the right direction.

Yet I rarely see the kind of holistic strategy that looks at the root cause of the fragmentation we're trying to integrate. The rusb to integrate has been cbaracterized by quick fixes and the proliferation nf Web sites that offer initial productivity gains and market share, but they fall short of the multidimensional integration requirements an enterprise must ultimately embrace.

Tn move beyond the first-generation integration mind-set, companies must undertake the integration challenge at the most senior levels. Internal and external business processes — including those performed by suppliers, outsourcing vendors and business partners — need to be aligned and integrated to conform to the new information organization. Existing data structures and information systems are both inputs to — and are impacted by — this process. Integration, by definition, must encompass every aspect of corporate infrastructure, business processes, external entities, data architectures, legacy systems and the Internet across an enterprise.

Corporate planners and IT leaders should step to the forefront of this initiative because it requires senior-level and cross-functional commitment. Building and deploying a multidimensional integration strategy will take many years. But organizations that delay getting started risk losing out on the continued productivity gains and market share growth potential in the decades ahead.

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E-commerce should be taxed like mail order

I AGREE WITH Bill Laberis ["Congress: Stop Giving the Internet Special Treatment," News Opinion, June 5]. Let's treat the Internet as any other mail-order business. That means you pay taxes on your Internet purchase if you happen to be in the same state as that business.

Taxing goods from any other state would violate Article 1, Section 9, Clause 5 of the U.S. Constitution, which reads, "No tax or duty shall be laid on articles exported from any state."

Brian Langenberger
Maplewood Minn.

BILL LABERIS IS half-right — his contention that Internet commerce ought not to be taxed differently than other commerce is correct.

But if you compare Internet commerce to the most closely related legacy business, namely mail order, the differences in taxation are not so pronounced. The model under discussion is not so much the Internet as it is business conducted across state lines.

If your supplier has a presence in your state, you're going to be charged sales tax regardless of how you ordered, or whether delivery is in person or via UPS.

Larry Brunelle
Allen, Texas
brunelle@acm.org

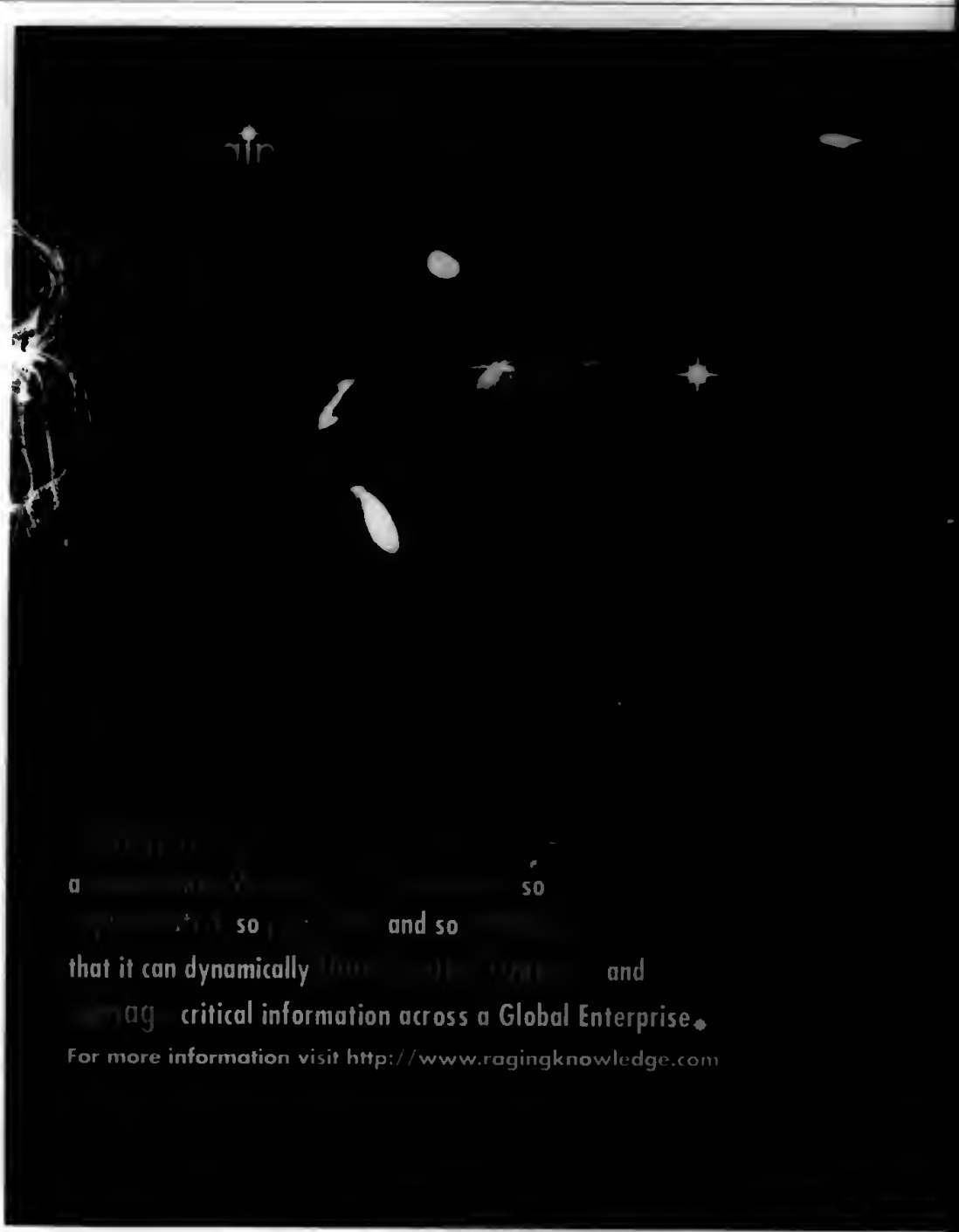
Cut the psychobabble

THE ARTICLE "Mourning an Old System" [Business, May 29] was too much. Please spare us the psychobabble in a leading computer magazine. There's enough of that bunk out there already. Businesses expand, and with that comes change. So do hardware and software environments. It's very easy to explain to the user: "This may be tough, but we all need to battle through it to survive and be competitive. You get to keep your job and perhaps make more money." Grief? Give me a break.

Stu Sjouwerman
President
Sunbelt Software
Clearwater, Fla.
w2knews@tampabay.rr.com

I WAS A POWER USER for two decades. I lived through uncountable technological changes, and they came more often and more comprehensively as the years went by. I never grieved for the loss of an old system.

What I suffered from were the effects of poor planning and, underlying it all, lack of support for people who were already overworked. The addition of new layers of work on top of old, the hours needed to learn the new while debugging it and correcting the mistakes derived from it, the expectation to be simultaneously doing the daily work that required expert use of an optimally functioning system and the need to beg for IT attention by being more insistent



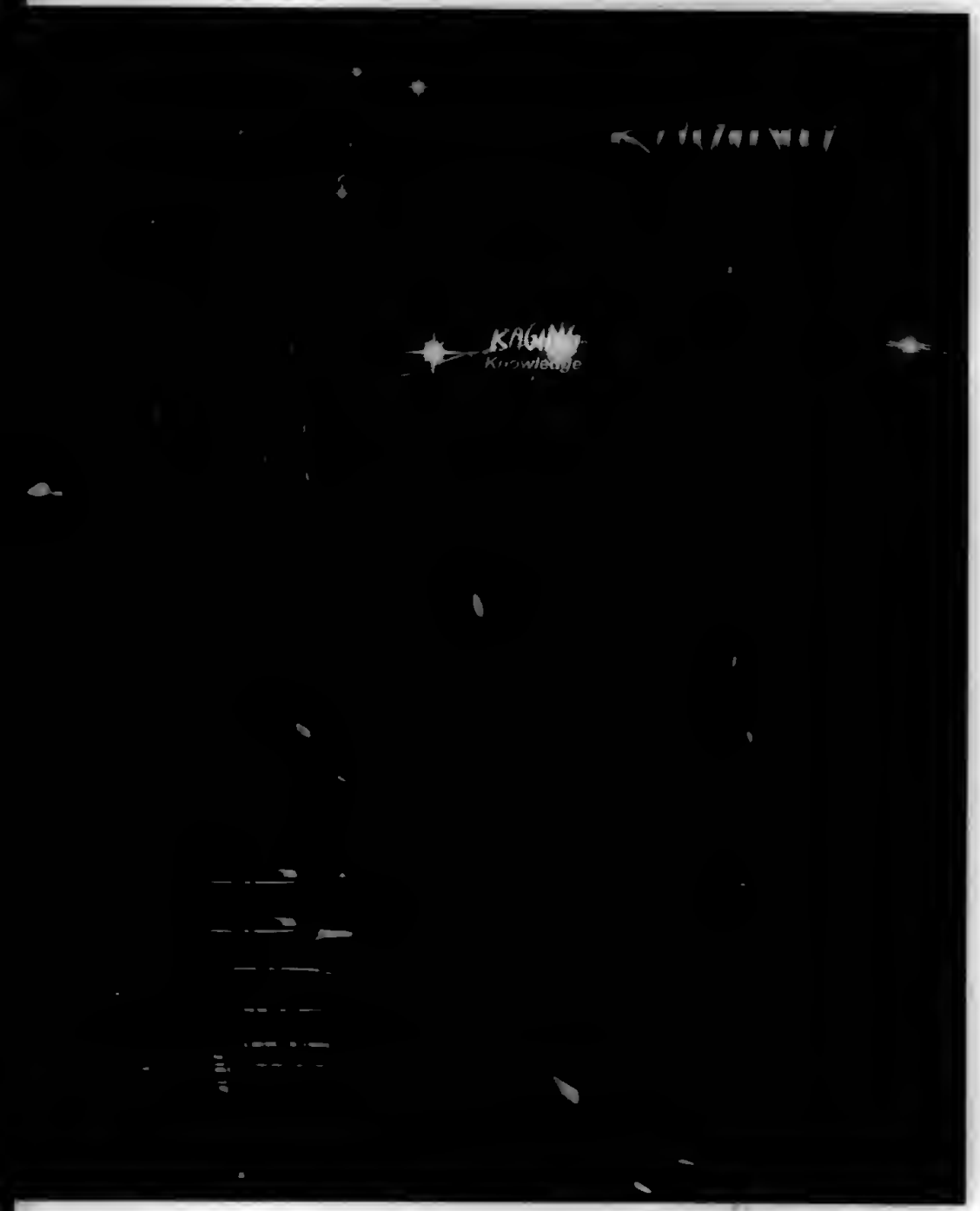
than other sufferers — these were the depressants, not change.

Sherry Gordon
Yellow Pine, Idaho
info@helpyoutravel.com

Marathon optimism

LET'S BE REALISTIC here for a moment, shall we ("Tool Kit to Boost Fault-Tolerance of Windows NT Servers," *Computerworld Online*, May 31)? With 99.999% uptime, your downtime is only about 5 minutes per year. This is totally ludicrous. Every time you install a software upgrade, it requires a reboot, and a reboot equals downtime.

Wayno Guerrini
San Diego
wayno@pobox.com



PDFs are a risk, too

UNFORTUNATELY, Dan Gillmor needs to include PDFs in his list of forbidden file attachment types ["Rx for Viruses: Get Tough With E-Mail Attachments," News Opinion, May 29].

Version 4 of the Acrobat Reader allows embedded JavaScript (or even simple one-click hyperlinks in a PDF document) to launch *any* file on the reader's PC. A JavaScript program that would launch a malicious executable can be set to run as soon as you open the PDF.

Version 3 of Acrobat also allows launching of executables via hyperlinks in the PDF, and without the warning notice that was introduced in Acrobat 4. As soon as you click on a bookmark or other hyperlink in the PDF, you could be dead.

Tom Thiersch
Concord, Calif.

Fashion is frivolous for IT

SO *COMPUTERWORLD* is now giving *GQ* and *Vogue* competition? Was the clothing article ["The New Dress for Success," Business, May 8] placed by public relations hacks for Banana Republic and The Gap? I find it hilarious that the dead topic of the "corporate casual clothing crisis" is hashed out yet again.

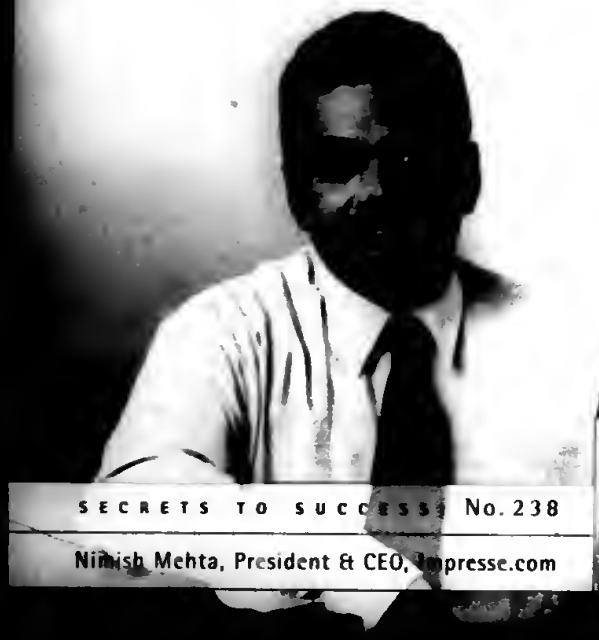
News flash: Most techies aren't concerned with fashion and wear what feels good. We would rather not have one set of clothes for work and one for play. Also, spending money on dry cleaning is a waste. I've worked at jobs in a tank top, sandals and shorts, and I've worked in a formal environment with a necktie. Do people care? No, as long as I conform to the dress code. Techies are paid for their brains, not their wonderful clothing choices — we aren't salespeople.

Later in the same issue, you profiled Scott Banister of Idealab ["E-Strategists," Technology], who breaks all the rules, yet is set at 24. Don't waste space on these inane, pointless stories. If the boss doesn't like what the employee wears, he will make that clear.

James Wasser
Long Beach, Calif.

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APPLICATIONS ON DEMAND



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Nimish Mehta, President & CEO, Impresse.com

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HEARINGS DELAY

A Senate committee that expects to spend all of its time and resources looking into United's planned acquisition of US Airways has postponed hearings into whether an online airline ticketing site violates antitrust laws. But the airlines' exchange isn't the only one being investigated. ▸ 41

REFERENCES

EBay lets buyers rate sellers online. Now online IT services clearinghouse BizBuyer.com is trying the same thing. The Web site is interviewing customers to see how well service vendors follow through on their promises and it will publish the answers for other buyers. ▸ 41

UNWELCOME INTERMEDIARY?

New business-to-business travel service GetThere.com is going up against the giants with promises of savings and better service. But many in the travel industry are skeptical that the startup can offer anything the big boys don't already provide. ▸ 48

WORK STRESS

A new survey says IT people are under increasing stress, primarily because of an increase in workload. New technology, business upheavals and deadline pressures take their toll, and with big staffing boles, most places have to pressure remaining workers to take up the slack. ▸ 47

WEB LEGACIES

Working on Internet time means developing systems fast to be first to market, but it also means that your latest hot system can become a dinosaur overnight, Ed Yourdon warns. The problem is what to do with applications whose developers have moved on — and which none of tbe survivors understand. ▸ 48

HELPING HANDS

As CIOs move into more business-centric roles, many are finding they need a solid, savvy chief technology officer (CTO) to pull the weight on the technology side. The problem is finding a way to arrange things so the CIO and CTO work in tandem rather than getting in each other's way. ▸ 50

RETENTION TIPS

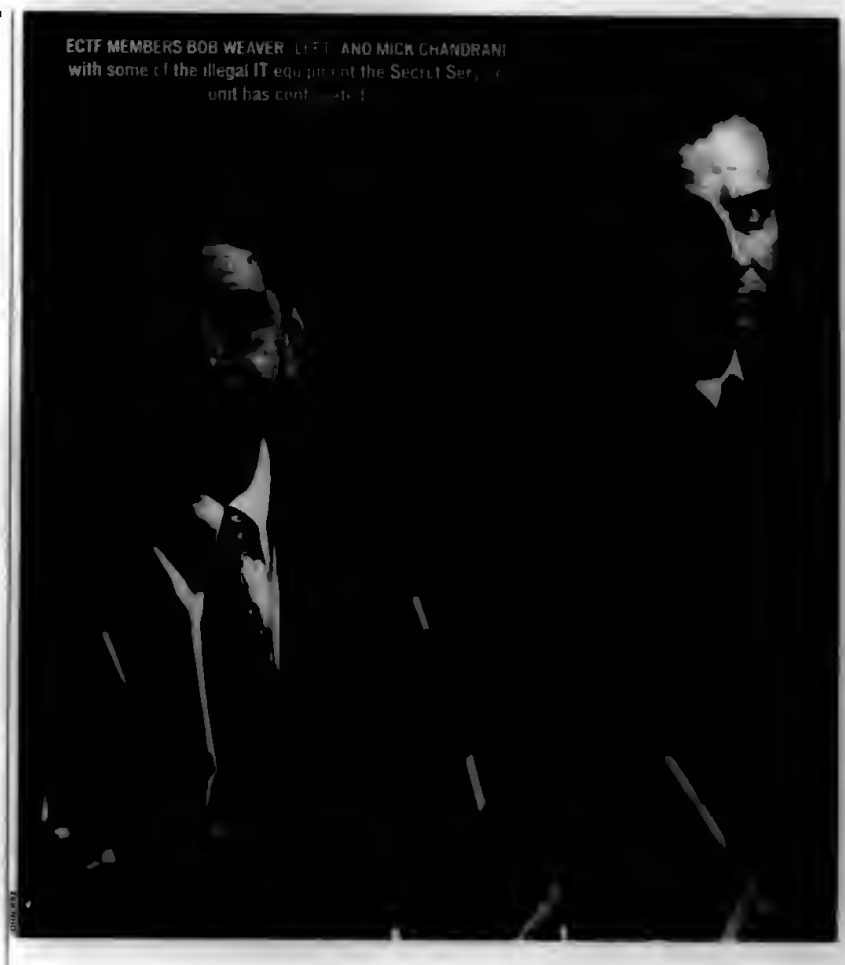
Companies at the top of *Computerworld*'s 100 Best Places to Work face the same staffing problems as other companies. But they also find creative ways to boost morale that go beyond the usual bennies. ▸ 54

DIVERSITY PAYS

Diversity encompasses more than the way you treat women or minorities, say CIOs at *Computerworld*'s 100 Best Places to Work. It's about supporting the unique needs of all employees — then seeing that effort pay off. ▸ 56

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ECTF MEMBERS BOB WEAVER [illegible] AND MICK CHANDRANI with some of the illegal IT equipment the Secret Service unit has confiscated

WALKING THE CYBERBEAT

A SECRET SERVICE UNIT called the Electronic Crimes Task Force (ECTF) is taking law enforcement to the cyberstreets of New York and Washington. The ECTF helped put John Gotti's mob in jail, nabbed identity thieves and nailed hackers in the act of attacking American businesses. The group has one advantage most law enforcement agencies don't — lots of help from the companies it's trying to protect.

44

ECOSOC 2000

United Nations Economic and Social Council



Information Technology for the World

The United Nations Economic and Social Council (ECOSOC) has launched a campaign to turn the "digital divide" into a digital dividend. At its meeting in New York from 5 to 7 July, corporate executives will share the floor with ambassadors, national ministers of information and heads of international agencies. The Council's recommendations will be sent to the UN Millennium Assembly, opening in September.

For more information, visit the "IT for the World" website at **www.un.org/esa/coordination/ecosoc/itforum**, *or contact Tim Wall at telephone: (212) 963-5851; e-mail: wallt@un.org.*

To find out about the UN's new programme for cooperation with the business community, visit the "Global Compact" website at **www.unglobalcompact.org**.

White Paper



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The

ROLE IN

Redefining Storage

John Webster
Senior Analyst &
IT Adviser
Illuminata Inc.

The Internet has had a profound impact on storage. Web-based processing environments can require extreme scalability, 100% system and information availability, and the capability to manage a rapidly growing collection of resources with an ever-dwindling supply of available staff. Indeed, the Internet is defining a new set of requirements for storage infrastructures and establishing a new set of best practices for sourcing, building and managing storage environments.

Web-based content stores can be viewed from two perspectives: that of the storage administrator and that of the user. The administrator sees Web storage as physical infrastructure — hardware, interconnects and management software all working in concert to deliver data as reliably and efficiently as possible, to the rest of the application stack. In contrast, the user's view of storage is far more abstract. Sitting in front of the browser screen, users see an unlimited source of virtually anything one can imagine, accessible with a mouse click.

The performance and availability of the storage environment has a direct effect on the user's overall Web experience. Storage is where Web content lives. If access to content is slow or nonexistent for even a short period of time, the user can quickly develop a negative impression of the site and perhaps will never return. Therefore, the browser user and the storage administrator, whether they realize it or not, are inextricably bound together.

The Internet is also spawning a new dimension within the storage industry itself — storage as a service. Before the Internet, the storage industry was roughly divided into two camps: component manufacturers and infrastructure providers. Component manufacturers produce drives, controllers, adapter cards, enclosures, etc. Infrastructure providers build disk arrays, subsystems and storage networks, controlled by specialized management software, from components supplied by the component manufacturers and independent management software vendors. Recently, a third camp has emerged — that of the storage service provider. SSPs use storage facilities, developed by the infrastructure providers, to deliver storage services using the Web as a delivery vehicle. In fact, SSPs have turned the Web into an enormous, if amorphous, virtual storage device.

Storage administrators now have a wealth of alternatives to turn to as a source for Web-based storage. The more savvy and brave administrator can build a custom storage infrastructure from scratch using off-the-shelf, commodity-priced components. For many reasons, though, most will turn to infrastructure providers for pre-integrated, tested and supported

storage solutions. However, the SSP now offers a third alternative. Rather than acquire, build and maintain a storage environment, one can simply tap into the SSP's readily available storage resources.

A Terabyte Per Day

The Web has severely damaged the notion that storage capacity growth can be managed in an orderly fashion. SSPs have a demand for additional capacity growing from one terabyte per month, to one terabyte per week, to one terabyte per day. That's not total capacity, but incremental capacity needed each business day. The often-heard Web dictum "Plan to be wildly successful" translates in the storage world to "Expect demand for additional storage capacity to exceed your wildest expectations." Here's another dictum for Web storage administrators: "Nobody throws anything away. Ever." E-mail from two years ago? Web pages from 1996? Still online!

Further driving the already burgeoning demand for Web-based storage resources is the need to capture data from and serve data to a rapidly increasing number of sources. These include browsers located on desktops, laptops, TV sets, cell phones and PDAs. We will soon find browsers in cars, trucks, household appliances and perhaps any device that can either be given a wireless interface or plugged into a wall socket.

Adding to this explosive growth is the requirement to maintain maximum competitiveness by creating a cool portal experience — a property often called "stickiness." To maximize stickiness, content is becoming more personalized and dynamic, adding requirements for capacity as well as layering additional I/Os on top of each mouse click.

Capacity growth and the ability to manage it — scalability — is one dimension in the Web-based storage management picture. Additional factors include:

- **I/O performance** - While most assuredly not the only factor in determining end-to-end response time, the performance of the storage environment can have a significant impact on determining how long users wait between mouse clicks.
- **Availability** – Web site blackouts — perhaps "whiteouts" is a better word — can amount to millions of dollars in lost opportunity costs, not to mention the immeasurable loss of prestige and the occasional loss of a few billion dollars of market capitalization. Therefore, the architecture of the Web-based storage environment must reduce or eliminate single points of failure, must be designed to back up and recover content databases with ease, and must be designed for data availability during regular upgrades and reconfigurations.
- **Manageability** – The critical shortage of qualified operations staff means that one must maximize the ratio of personnel to capacity managed. Numerous factors can enhance manageability, including the ability to consolidate data and reduce the number of copies that must be maintained, and support for multiple disparate host operating systems.
- **Flexibility** – The competitive landscape will change dramatically and without warning for any dot-com or enterprise engaged in e-commerce. In response, Web sites must be able to reconfigure and redeploy quickly to thwart competitive challenges and maintain a leadership position.
- **Recoverability** – Anomalous operating conditions, occasional data loss, and subsystem failures are inevitable in



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an environment that strives for continuous availability. Attacks from outside the firewall are also becoming more commonplace. The challenge for the storage administrator is to create an environment that can recover from these events as quickly as possible.

Examining the Alternatives

Once storage and servers were inextricably bound. No longer. Storage networking alternatives developed during the last few years are now essential to the foundation of a high-performance, consistently available Web presence. Storage area network (SAN) and network attached storage (NAS), both alternatives to the traditional direct attach, storage-to-host method, are the two most often implemented topologies in enterprise-class Web hosting environments because they accommodate the many and varied demands placed on the storage environment by Web-facing applications.

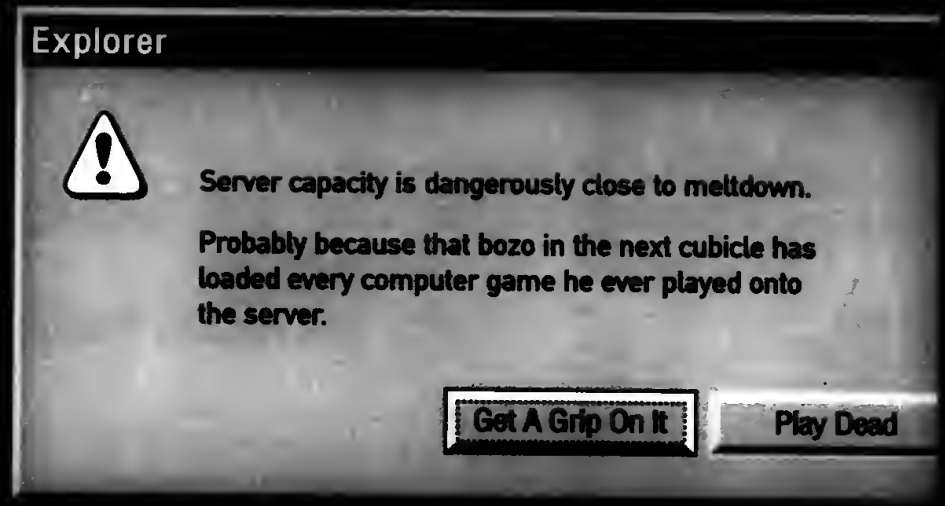
It is essential to match the requirements of the Web-serving application stack with attributes of each alternative — direct attach, SAN, NAS or hybrid. Vendors and systems integrators with experience in numerous Web-based storage implementations have arrived at the following rules of thumb, which apply equally well to new dot-coms and established enterprises.

- Business needs and application needs should heavily influence if not dictate the Web storage architecture and component selection.
- Direct Fibre Channel host-to-storage-attachment yields the best I/O performance, but sacrifices to flexibility and manageability must be tolerated.
- When large databases are involved in the application mix, SAN or direct storage-to-host-attachment yields the best performance.
- NAS is a very cost-effective solution for read-intensive applications (Microsoft Exchange, media streaming, webcasting) front-ended with multiple servers.
- SAN is the most flexible solution in multiple-application environments or situations where business requirements change quickly.
- NAS is an effective tool for caching high-volume, static content.
- SAN is the preferred architecture for high-availability, high-stress environments.
- NAS and SAN are equally recoverable (up to the capacity limitations of individual arrays).

NAS/SAN Hybrids

Perhaps to the detriment of both topologies, the choice between NAS and SAN is often portrayed as one vs. the other. This is unfortunate, as both have their place in Web-serving scenarios. On a positive note, a third hybrid alternative, which integrates both SAN and NAS, is now being deployed as products from the vendor community become available to support a combined SAN/NAS storage environment. This topology has been described as a SAN "backbone" with a NAS "frontbone."

The broadcasting industry offers an excellent example of the effectiveness of a hybrid storage model combining SAN data sharing and management flexibility with IP-based Webcasting. In addition to offering more or less static Web content, broadcasters are delivering live broadcasts through Web-based channels as well as leveraging assets with webcasts of previously aired material. A NAS/SAN



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• Promotes high availability by modularizing storage and channel resources that can be isolated if a failure occurs. Array and data path redundancies also greatly reduce single points of failure.	• Compared to direct attached storage, eliminates the need to replicate the data across all Web servers, easing the process of publishing and maintaining data.
• Supports logical rather than physical data movement, greatly simplifying the reconfiguration of the storage environment in response to competitive challenges and application updates.	• All log data can be collected and analyzed in one location (critical for retracing site traffic).
• Enables centralization of storage resources, reducing overall storage management expenses on a cost-per-megabyte basis.	• Simple and straightforward, because TCP/IP is more commonly understood by network administrators.
• Maximizes capacity usage and storage efficiency, particularly when clustered severs or server farms are to be deployed.	• Supports multiple servers and multiple operating systems simultaneously.
• Implements a storage environment capable of adapting to a broad range of new products and technologies as they become available.	• Can be deployed and brought online quickly; nicely suits the rack-and-stack data centers common in e-business.
• Scalability not limited by the capacity of a single storage array or controller.	• Consolidates storage resources, simplifying management.
• Supports both heavy read and mixed read/write application loads.	• Decreases the actual amount of storage required to support a large number of Web servers.
	• Relatively low total cost of ownership.

model enables broadcasters to present a NAS interface for streaming content over IP to webcasting servers, but with a SAN back end. Broadcasters get the IP networking and Web caching capabilities of NAS with the flexibility and manageability of SANs.

To make this work, raw audio and video content from many sources — satellite, reporters, syndicated news feeds — is stored in the SAN environment. Dedicated servers attached to both the SAN and IP network manage access to and placement of data within the SAN environment. Other servers are attached to the SAN host content creation and editing applications. However, content is broadcast over the Web via Web servers that have a front-end IP interface and a SAN interface on the back end.

The SAN/NAS hybrid architecture in this scenario allows the broadcaster to accomplish the following with the same infrastructure:

- Aggregate content acquired from multiple sources onto



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a consolidated storage platform, each with its own performance requirements and data usage patterns

- Make stored content available simultaneously to multiple applications – composing, editing, broadcasting and webcasting
- Eliminate the need to laboriously replicate content across multiple Web servers
- Implement hierarchical storage management technology for the quick retrieval of audio/video files archived to SAN-attached tape
- Manage the entire content storage and retrieval infrastructure from a single console.
- Automate content management functions, viewing all information assets as a unified logical repository.

Solutions that enable the integration of NAS and SAN have begun to populate the product landscape. They will become even more numerous later this year. Solutions will range from relatively simple bridges linking SANs directly to an IP network to disk arrays with both Fibre Channel and IP network attachment capabilities.

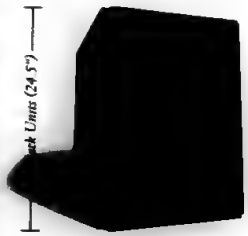
The Storage Service Alternative

The Web has played a seminal role in the creation of a new storage model that offers storage as a service rather than a value-add package or solution set. Alternatives to homegrown and vendor-architected storage implementations are appearing in many forms. In rapid succession, we have seen storage utilities, storage POPs, free megabytes, all from a group of vendors called storage service providers or SSPs. SSPs have largely been dot-com start-ups but lately some more established players have entered the field including computing vendors, storage vendors, traditional outsourcers and even telcos.

It's perhaps best to think of using an SSP when the business problem at hand is essentially storage-related. From the standpoint of the Web, some of the storage-related business problems most readily solved by SSP alternatives look like the following:

- A distributed workforce needs a consolidated repository that views onto a shared information base. Examples include all sorts of development teams, whether software engineers working together on a programming project, authors working together on a complex document or a marketing staff putting together a multipart proposal and sales presentation. Such groups are often ad hoc, and lack the integrated IT team — not to mention the time or the IT budgets to assemble their own workflow mechanisms and content bases. SSPs can provide users a ready-made infrastructure for collaborative work; from the technology or administration point of view, much of the underpinnings are essentially a managed pool of storage.
- Uncontrollable or unmanageable demand for additional storage capacity is throttling growth or negatively impacting a level of service required to satisfy Web-site visitors. Here's an extreme example: The Internet has spawned Web-related freebies in just about every industry segment, and storage is no exception. More than a dozen companies now offer a block of storage, accessed via the Internet, for free and their capacity growth rates are staggering. One is reportedly adding a terabyte per day and has stopped provisioning the capacity from infrastructure vendors in favor of another SSP that will supply the capacity on demand — a case of one SSP outsourcing from another.
- Staff simply cannot be hired to build, deploy and/or





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manage the storage environment and meet an absolute requirement to get products or services to the Web-wired world in the shortest time possible. There is a critical shortage of IT personnel with storage experience in general, and storage networking experience in particular. When Internet time is of the essence, an SSP may be the shortest route to the market.

- The sometimes sudden and unforeseen need for a disaster recovery solution. The strong of the Web world will survive by recovering data and applications quickly, perhaps without any interruption of service. Disaster recovery plans can be costly and time-consuming to implement in-house, making an SSP's contribution to this effort worth investigating.

Watch This Space

The storage as a service model is an important evolutionary step in the progress of storage provisioning. We have long had storage hardware — boxes, drives, controllers and adapter cards. These now serve as the building blocks for storage infrastructure — arrays and interconnect gear. Storage management software has also evolved from simple point solutions to frameworks that encompass many functions and many components in a storage network, controlling them from a single console. It is now possible to build — and many vendors are now bringing to market — storage solution sets that combine hardware and software. These solution sets are aimed at solving business problems. Storage solution sets designed specifically for Web-serving



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applications are also beginning to appear.

The service model moves storage even further away from pure physical hardware and into a more abstract domain. An electric utility is the analogy commonly used. Various entities, from Web sites to established corporate data centers, plug applications into the storage utility, just as consumers of electricity plug appliances into wall sockets. Users of the storage utility pay for storage capacity on an as-you-go basis.

As electric consumers, we take for granted that whenever we plug in the toaster, we get toast, any time of the day or night. In the storage analogy, the utility guarantees 24/7 availability of virtually unlimited capacity as well as compliance with other service metrics like performance and data security. However, unlike the electric company, the actual location of the storage utility could be any one of three places: a corporate data center, an internet or application service provider (ASP) site or a dedicated storage facility on the Web with services delivered over the wire.

The following are three fundamental elements required to make the storage service model work.

- **Tested and Fully Integrated Infrastructures.** These include disk arrays, interconnect components and management. The infrastructure enables scalability and reconfiguration without service disruption. Network interconnections also provide the pathways by which management software monitors usage and performance, and control operations.

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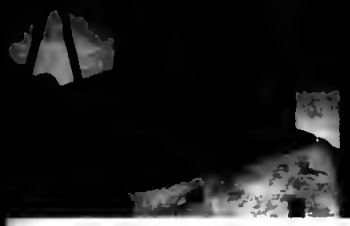
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- **Monitoring Software.** The service vendor monitors capacity consumption by the customer in order to generate invoices based on usage and ensure that service levels are maintained. The customer can also be given access to a subset of these monitoring capabilities to validate service-level agreement-based service charges.
- **Capital.** A pay-as-you-go pricing model requires that someone other than the customer owns the assets and the staff. Therefore, building storage utilities requires a significant investment in infrastructure, software development and personnel.

For years, the disk array has been the center of the storage universe. Around it, vendors have wrapped software and services to add value, attempting to elevate the array to a price point well above commodity status. However, open storage management software supporting a heterogeneous mix of storage subsystems and arrays has now emerged as an independent and fast-growing segment of the storage industry, brought on by the need to manage explosive information growth and complexity. As a result, it will become increasingly more difficult for array vendors, both independent and systems-related, to maintain control over software as a value-add factor.

Solutions that enable the integration of NAS and SAN will become more numerous later this year.

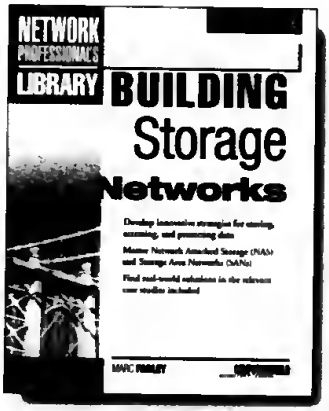
The good news for array vendors is that selling storage as a service, delivered via the Web, embeds the array within a tight and comprehensive framework of components and management software — the storage infrastructure. And right now, there is an almost insatiable demand for Web-based storage infrastructure solutions. However, if both dot-com and established corporate users begin to show a preference for buying storage as a service, rather than a solution, the door will be open for other well-funded outsiders to enter the SSP market. SSPs will then compete on a cost-per-megabyte basis with the pure infrastructure players, further commoditizing the infrastructure tier and putting even more downward pressure on the overall cost of storage. Historically, the commoditization of services and products on the Web has driven price levels to zero.

Does this mean that SSPs are about to break free from commodity pricing pressures that have traditionally characterized the storage market? Not at all. In fact, SSPs may be in an even more precarious position than they have been. Consider a customer who is an IT executive whose major operational headache is internal e-mail. His company has the luck to be enjoying success, but the executive's e-mail headache stems from having to expand the storage environment to support the e-mail system. Each time the system grows, performance problems and availability issues arise with added capacity. So the IT executive decides to outsource the e-mail headache to a Web-based service provider. But a question comes up for the executive when it comes time to evaluate price points: is the new e-mail services vendor an ASP or an SSP? The Web-based service provider is indeed solving what is essentially a storage problem; nevertheless, we would regard the outsourcer in this case as an ASP rather than an SSP, and if the IT executive does the same, he will



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SAN User Experience: eData.com

eData.com is a rapidly growing database services company using the Internet as a delivery vehicle. Its frequently updated data warehouse contains information on more than 11 million US businesses and 150 million consumers.

eData.com uses a proprietary Virtually Instant Analysis Engine (VIAE) of its own design based on readily available technology from major vendors to provide rapid access to large and complex databases. VIAE allows for real-time access of information through applications running at customer sites or at eData.com. eData.com's IT facility supports computer operations as well as data and application hosting services for eData.com customers. The architecture allows multiple views of the same section of disk, as well as an ability to respond quickly to changes in business requirements without reconfiguring the storage environment.

At eData.com, the rapidly growing customer base induced architectural complexity in a relatively short time. The original implementation used direct host-to-storage SCSI cabling, risking a disruption of service as eData.com continually reconfigured and recabled to meet new customer requirements. Executives at the company decided that replacing the rat's nest of SCSI cables with a Fibre Channel-based SAN would greatly mitigate the risk.

With the help of its installed vendors, eData.com took just two months to migrate its entire storage complement (then about 24T bytes) to a SAN environment consisting of Fibre Channel host bus adapters, Channel Adapters, switches and hubs.

But it wasn't as simple as it sounds. What started as a relatively straightforward replacement of SCSI cables quickly became a project to automate information management tasks and thereby enhance service delivery to customers. Using the SAN, eData.com discovered that it could turn the distributed computing model on its head. In the distributed model, servers remain in one place while data moves between them — a process that can take hours for large blocks of data. In the SAN model, data remains in one place while servers are connected to the data as needed. Using Fibre Channel switching, servers can access needed data in micro-seconds. eData.com took the final but important step of writing scripts to automate this process.

eData.com's warehouse has since grown to 54T bytes. It recently added 14T bytes of green-pasture storage to the SAN in two hours, without disruption. It now offers three closely related services offerings:

- **Data enhancement** — data cleansing, file matching, data appending and customer profiling services.
- **Data hosting** — customer-specific data hosting solutions.
- **Custom Internet-based access tools** — customized versions of Internet-based access tools to interface with tailored databases.

SAN technology allows eData.com to grow rapidly as new customers come on board and to satisfy changing needs of its current customers without disruption.

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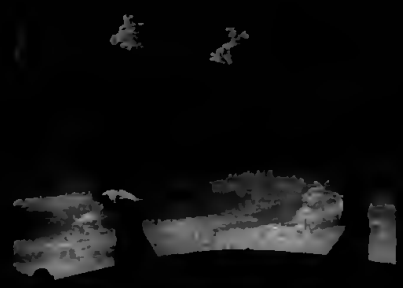
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demand certain pricing structures and service-level agreements that do not reflect the service provider's costs in terms of storage. The dilemma for the players in the SSP group will be to base their differentiated positions in the marketplace on their ability to solve specific business problems, such as the one just mentioned. To do so, some will morph their positions in the direction of ASPs, and consequently face stiff competition from established players, while others will continue to market themselves as SSPs and expose themselves to commodity pricing pressures. In short, no matter which strategic position is chosen, SSPs will have few satisfactory business choices.

The Web will continue to profoundly influence the way we think of and acquire storage. We will look to those who have implemented Web-based high-performance, high-availability storage architectures to learn more about how it was done and apply that newly learned expertise to other application environments. We will also expand upon the many possibilities for solving business problems and creating business opportunities the Internet offers as a virtual storage medium.

NAS User Experience

ON24 is a provider of online, personalized financial news for investors produced as audio/video webcasts, available free to more than 70 million users through its partnerships with Yahoo Finance, Merrill Lynch, AltaVista Money, Lycos, SNAP and others plus a network of more than 500 financial partner sites. ON24 customers can also access video clips, audio clips, Windows Media content, and Web server objects such as HTML pages, and JPEG images.

Currently, the company has more than a million viewers using its services monthly, with the average user session exceeding 18 minutes. On a monthly basis, 7.5 million new page impressions are stored, and nearly 2 million stream views are downloaded to users. ON24 maintains two nearly identical configurations in California and New York.

ON24 has implemented multiple Linux and Windows NT Web servers, back-ended with NAS technology. NAS was chosen, partially because of its desired performance characteristics in ON24's chosen applications scenarios, as well as staff familiarity with IP vs. Fibre Channel as a data transport medium.

Multiple servers concurrently access NAS-based data via virtual LAN environments at each location. Stored content supports streaming audio and video, Windows Media (NetShow), and Web server objects including XML documents for subscribers and affiliates to post on their portal sites, and HTTP and HTML pages subscribers see when they view the ON24 site. Identical content resides on the NAS devices in both locations, which ON24 updates simultaneously. ON24 also archives to tape time-sensitive content when it becomes one year old.



Was it fear that drove 9 of the top 10 Internet companies to Network Appliance?

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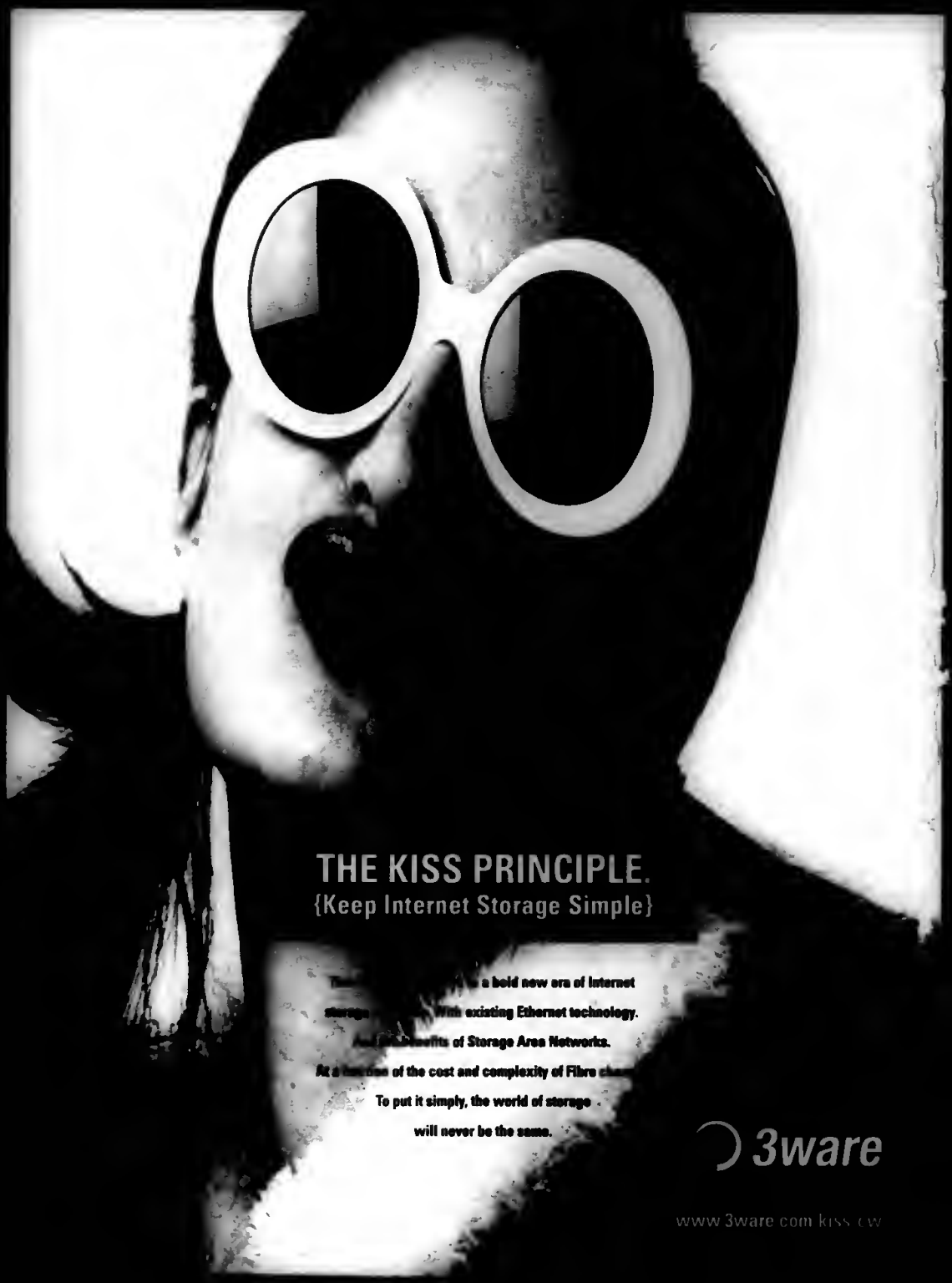
Which is exactly what drew those companies to Network Appliance™ storage and Internet caching solutions. That, and 99.99+% uptime. Plus the speed they add to data delivery. Not to mention the ability to recover lost or corrupted data in minutes instead of hours or days.

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Senate Postpones Airline Hearings

Online ticket site to be investigated later

BY MICHAEL MEEHAN

A BRICK-AND-mortar merger has put on hold Senate hearings that could determine the future of major electronic-business initiatives.

Facing the time-consuming task of reviewing Chicago-based United Air Lines Inc.'s proposed $11.6 billion purchase of US Airways Group Inc., the Senate Commerce Committee has postponed the June 22 hearing on an online ticketing Web site being funded by the five largest airlines in the U.S.

No new date has been set, but Orbitz — known informally as T2 before announcing its new name last Monday — is the first joint online venture between Fortune 500 competitors to receive this type of scrutiny from Washington.

Fresh from its successful prosecution of Microsoft Corp., the U.S. Department of Justice (DOJ) is investigating whether the airlines would form an anticompetitive cartel if they gained control of the ticket distribution channel. The nation's leading automakers and meat packers are also being investigated for similar initiatives.

Pia Pialorsi, press secretary for the Senate Commerce Committee, said the Orbitz hearing remains a priority for committee Chairman Sen. John McCain (R-Ariz.).

The Chicago-based airline ticketing venture, which hopes to launch its Web site this summer, declined to comment on the delay of the hearing or on whether the Commerce Committee's move will have any impact on the planned launch.

But Orbitz officials held a press conference last week in which they insisted that the Web site will create, not stifle, open competition in the airline ticket marketplace.

As part of the press conference, the Orbitz executives said they already gave the government copies of all the contracts Orbitz signed with its participating airlines. But that hasn't derailed the Senate hearing or a separate DOJ investigation, which both came in response to complaints about Orbitz filed by two travel agent trade groups.

"The documents might say one thing, but how are they going to act in the real world?" asked Sam Whitehorn, senior Democratic counsel to the Commerce Committee. "The words on paper might not tell the whole story."

The Orbitz site is being funded by United, Delta Air Lines Inc., Continental Airlines Inc., Northwest Airlines Inc. and American Airlines.

Whitehorn said it's incumbent upon the government to look into initiatives funded by large-scale competitors.

"If it turns out that there's nothing nefarious, then let them go out in the marketplace," he said. "We haven't looked into it enough to determine that yet."

The Orbitz name also was unveiled at the press conference. The company has yet to hire a full executive team or to name its board of directors.

The site has started with funding from airlines, but Chief Technology Officer Alex Zoghlin said Orbitz is looking for investors from all arenas.

When asked what the airlines gain if Orbitz functions as a truly independent entity, Zoghlin answered the motive is profit, not control.

"If this is wildly successful in the consumers' eyes, then there's money to be made out of it," he said.

One of Orbitz's consultants was also at the press conference — Washington attorney Cornish Hitchcock, who has been active in the Aviation Consumer Action Project.

Hitchcock argued that current computer reservations systems favor certain airlines, prevent travel agents from shopping the marketplace and charge exorbitant fees.

He called Orbitz "a 21st century solution to the computer reservations system problems consumers have seen over the last 20 years." ◗

Orbitz Timeline

Nov. 10 Delta, United, Continental and Northwest announce new online ticketing venture.

March 28 The venture's first executive is named: CTO Alex Zoghlin.

April 28 American Airlines joins as an equity partner.

May 16 Senate Commerce Committee announces antitrust hearings concerning the Web site. Two days later, the DOJ reveals it's conducting a separate investigation.

June 12 Company unveils official name: Orbitz.

IT Services Exchange Asks Buyers to Review Sellers

Hopes info will add more credibility

BY JULIA KING

Lots of companies now regularly buy commodity products like PCs and printer cartridges on Internet-based exchanges.

Services, on the other hand, have been a tougher sell. At issue is the quality of service providers. Many of the new digital marketplaces list vendors without evaluating them. Instead, the sellers simply pay a listing fee, and they're in [News, May 29].

But now BizBuyer.com in Santa Monica, Calif., hopes to instill a bit more credibility into the online buying process.

A year-old exchange that specializes in Web site design, e-commerce projects and other high-tech services, BizBuyer.com doesn't only evaluate suppliers, it also interviews three to five of the suppliers' customers to gather information about whether suppliers completed projects on time and at the contracted price.

BizBuyer.com also interviews the suppliers about the number of employees they have, their qualifications and their professional certifications, among other things.

Beginning this month, Bizbuyer.com, which already provides users with software tools to craft requests for proposals and to compare bids online, is also promising to mediate disputes between buyers and sellers and to reimburse customers up to $5,000 for unsatisfactory performance by a prequalified vendor.

BizBuyer.com also will give sellers information about why buyers may have rejected their bids. Buyers who delete bids are required to provide information on why they did so. This information is shared with all vendors participating in the bidding process.

"There's a trust element we need to build," said BizBuyer.com CEO Bernard Louvat.

Sometimes referred to as the "eBay for B-to-B," BizBuyer.com handles about 25,000 bids per month for services that range from installing telephone systems and hosting Web sites to designing and developing Web sites. BizBuyer initially targeted businesses with 20 to 500 employees, and its average transaction value is now about $8,000. But Louvat said larger companies are now tapping into the exchange, which is free to buyers. Sellers pay a transaction fee that ranges from 1% to 10% of the total value of the services purchased.

AT A GLANCE

BizBuyer.com

- Based in **Santa Monica, Calif.**
- Financially backed by **eBay Inc.** CEO Meg Whitman, **CMGI Inc.** and others
- **Matches** buyers and sellers of Web site design and other services
- Free to buyers, sellers pay transaction fees ranging from **1% to 10% of deal**
- **Prequalifies** suppliers
- Offers **$5,000 money-back guarantee** to dissatisfied buyers



VINCE BORREGO received five bids within an hour through BizBuyer

Satisfied Customer

Vince Borrego, information technology manager at Epocrates.com, a San Carlos, Calif., company that delivers medical information to physicians over wireless devices, used the exchange to buy a telephone system and installation services.

"It was pretty amazing. I received five bids back within an hour," Borrego said. "It easily saved me a month in finding vendors." He said he chose a provider from the Los Angeles area and subsequently contracted it for additional services.

Borrego said the money-back guarantee will play well with security-conscious IT managers.

"It all comes down to security when you're selling to IT people. But so far, I haven't had any problems," he said.

Steve Simpson, communications director at Adoto Inc., a Seattle-based start-up that develops Internet-based software for the fashion industry, said BizBuyer shaved weeks from the process of finding and hiring suppliers of software development, telephone installation and IT recruiting services.

"What they do is save you time in prequalifying vendors and then letting you compare them apples to apples," Simpson said. ◗

Windows 2000

What is Windows 2000 Advantage?

Windows 2000 Advantage is the partnership among Microsoft, Compaq and Computerworld Enterprise Business Solutions to inform IT leaders about Windows NT and Windows 2000 technology by providing timely, useful information — in print and online — for planning and deploying Windows NT and Windows 2000 with Compaq services and solutions.

Online This Week

Windows 2000 proves its reliability

Users are going for Windows 2000 as a server platform that offers the same price performance advantages as Windows NT, but with greater reliability and manageability, says Joseph Clabby, vice president, platforms and services at Aberdeen Group. "I will say that I'm surprised it took off so quickly," Clabby declares.

Compaq ProLiant 32-way server delivers partitioning and exceptional performance on an industry-standard platform

The 32-way servers Compaq is slated to release later this year represent at least two firsts for the company: A ProLiant server with more than eight processors and support for server partitioning.

Testimonials suggest Windows 2000 is ready for prime time

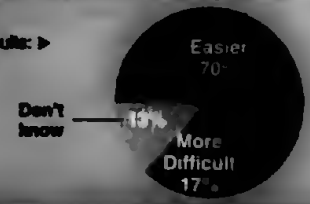
As part of our Momentum series, this story shows that there is mounting evidence based on independent lab tests and user installations that Windows 2000 is an enterprise-ready operating system that offers equal parts scalability and reliability.

Quick Poll

As you learn more about Windows 2000, do you believe it will be easier or more difficult to implement?

Cast your vote now at www.Windows2000Advantage.com.

Check out the current results: ▶
Base: 30



Microsoft

Comparing Windows 2000 Server Versions

By Bob Williams and James Morris

In this article, we explore the three server versions in the Windows 2000 product family and where they best fit within different computing environments. Windows 2000 Server versions solidly secure Microsoft's place in the enterprise. Responding to perceived shortcomings of Windows NT, Windows 2000 is built for industrial-strength reliability and manageability. Taking the best features from Windows NT, Microsoft has added a slew of new features to Windows 2000. These features vastly improve uptime, scalability and administration of the Windows Server family.

Windows 2000 Server, Advanced Server and, coming later this year, Datacenter Server. All three products include the same core set of features and functionality, with the emphasis being on reliability and manageability. Advanced Server adds support for more RAM and processors, two-node clustering and network load balancing. Datacenter Server adds support for even more RAM and processors and up to four-node clusters.

Perhaps the most distinctive new feature of Windows 2000 Server versions is the standards-based Active Directory service, which provides a rich enterprise directory service and the basis for many of the management improvements. Additionally, the Active Directory includes a number of programmatic interfaces that make scripting basic tasks much easier. (See March and April issues for technical reviews of Active Directory.)

The Windows 2000 Server family brings to information technology managers a single point of administration, management and security for resources throughout the enterprise. This includes the management of users, printers, file services, devices, databases, DNS and more. Administration can easily be delegated, allowing managers to give up only as much control as necessary to let their staffs do their jobs. Microsoft has also integrated Terminal Services into each of the Windows Server family products. As discussed in the April issue, two administrative licenses are included with each server. This facility makes remote administration simpler.

Windows 2000 Server is the workhorse of the family. Microsoft defines this version as "the multipurpose network operating system for businesses of all sizes." It is well suited for basic services such as file, print or communications. Windows 2000 Server is a reliable operating system and lacks none of the key features of the Windows Server family. It is ideal for use in small businesses as an intranet server, file and print server or communications server.

For the full text, visit www.Windows2000Advantage.com.

AT A GLANCE

Windows 2000 Server Family

Windows 2000 Server
- Scales to up to four processors
- Up to 4G bytes RAM
- Available now

Advanced Server
- Scales to up to eight processors
- Up to 8G bytes RAM
- Two-node clusters
- 32-node network load balancing
- Available now

Datacenter Server
- Scales to up to 32 processors
- Up to 64G bytes RAM
- Four-node clusters
- 32-node network load balancing
- Multiple OS instance capable
- Process control
- Available this summer

ADVANTAGE

The Web Magazine for IT Leaders
Implementing Windows NT and Windows 2000 with Compaq Services and Solutions

▶ **Feature**

Users gaining unprecedented remote access capabilities

By Mary Ryan Garcia

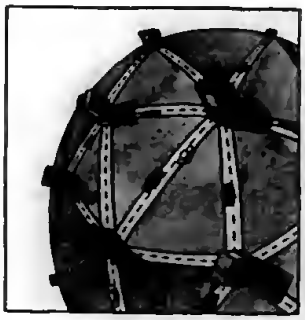
Compaq's new Remote Insight Lights-Out Edition board gives IT administrators round-the-clock access to their servers, regardless of location.

Imagine visiting Denmark on business and being able to remotely manage network servers at your company's headquarters in Texas. Does it sound like an impossible task? Not anymore.

Russ L. Deer, a network analyst with Pacific Life, is one user who is now doing what formerly was so difficult. His experience is described below.

According to Aman Dokania, Compaq product marketing manager, industry standard server division, Compaq's new Remote Insight Lights-Out Edition board gives IT administrators round-the-clock access to their servers, regardless of location. The product, a LAN-only version of the Compaq Remote Insight Board/PCI, provides full remote control of hardware and operating systems through a client browser. It is designed to be used at data centers or at distributed locations that have no IT staff on-site. Compaq Remote Insight Lights-Out Edition has its own dedicated processor, memory, NIC and comes with an external power backup through an AC adapter.

"Remote management tools are a survival issue for companies with distributed servers in small locations that can't justify remote support personnel," says John E. Girard, vice president and research director, with the Gartner Group's Research Advisory Services in Stamford, Conn. "Sometimes in the past it was enough to ask someone to hit the power switch, but systems today are too complex to be fixed so simply and downtime in a realtime business world causes substantial loss of money. Dead or malfunctioning systems frequently can't be accessed via a network, meaning that direct access to the screen and keyboard are essential."



One increasing problem, explains Girard, comes from the growth of the server hosting market. It might seem like an ideal solution for dealing with systems, but companies that utilize hosting opportunities sometimes discover that the service provider does not want to offer them direct access to systems and the secured rooms hosting the servers, for reasons including the maintenance of a high degree of physical security and privacy for all of the hosted systems.

"However, the users can do proper maintenance and upgrades without direct console access, especially if the server decides to stop working," he observes.

Enter Compaq's Remote Insight Lights-Out Edition, which allows browser access to Compaq servers through a hardware-based, operating system-independent graphical remote console. Since it is hardware-based, it does not require additional software or use any host-server CPU cycles. The on-board graphical remote console capability turns the client browser into a virtual desktop, no matter what operating system the host server is running or where the server resides. The product also includes additional features, such as a virtual power button, DNS/DHCP IP auto-configuration, and ROM-based configuration capability.

According to the company, Compaq Remote Insight Lights-Out Edition may be used to deploy a "headless" server that does not require a monitor, keyboard or mouse. If Compaq Remote Insight Lights-Out Edition is deployed in every server in a rack, it is possible to eliminate these devices as well as the switchbox and associated cabling.

For the full text, visit **www.Windows2000Advantage.com.**

Point

The 2000 Generation: BackOffice Server 2000 targets medium businesses

By Nora Isaacs

When building a corporate IT infrastructure, various businesses, departments and branches have a unique set of needs. BackOffice Server 2000, Microsoft's latest in its 2000 Generation series of server suites, will meet those needs by providing tools and services for building a solid information technology foundation.

Scheduled to be introduced by year's end, the integrated suite includes individual Microsoft server application components and the Windows 2000 operating system. This mix enables easy setup, deployment and suite management, which ultimately reduces the cost and complexity of managing scalable IT solutions.

"BackOffice Server provides value-added features on top of the individual server application components and binds them together," says Joel Sloss, product manager for BackOffice Server. "It's more turnkey than if you were having to take all the stand-alone application separately and build it all yourself."

Integrating BackOffice Server with Windows 2000 produces enhanced scalability, reliability and manageability. Empowered by Windows 2000, BackOffice Server comes with all the benefits of Windows 2000 Server and the most up-to-date server applications: Exchange 2000 Server, SQL Server 2000, Host Integration Server 2000, Systems Management Server 2.0 with Service Pack 2 and the next release of Proxy Server.

BackOffice Server takes advantage of Windows 2000's Active Directory to integrate applications, users and data. The server's snap-ins for the Microsoft Management Console will host management applications and create customized tools that can then be distributed to other administrators. In addition, Windows 2000 Server combined with BackOffice Server components like Microsoft Proxy Server and Microsoft Host Integration Server 2000 will create a unified network infrastructure for enhanced Internet and Internet performance and replication services.

For the full text, visit [illegible]

GO

The Cyber-Mod Squad Sets Out After Crackers

The Secret Service's Electronic Crimes Task Force does battle against a growing army of IT criminals

BY DEBORAH RADCLIFF
NEW YORK

MARCH 19. Internet Trading Technologies Inc. (ITTI) takes the first of a series of crippling denial-of-service shots to its online trading systems. Just as technologists block the offending incoming IP address, the company gets slammed again from another IP address.

New York-based ITTI's information security consultant places a call to Bob Weaver, operations manager of the New York-area Electronic Crimes Task Force (ECTF), a 240-strong cyber-Mod Squad that's trained for operations like these. The next morning, Weaver's team of three sets up a war room at ITTI's data centers. They analyze and trace the offending IP traffic while calling telephone companies for traces on the lines and simultaneously faxing subpoenas.

"Have you ever seen a movie with a kidnap scene — agents sitting around monitoring equipment and phones? It's that type of setting you now have in the corporate sector," says Ed Stroz, founding president of New York-based security consulting firm Stroz and Associates. Stroz called the ECTF on behalf of ITTI.

Four hours later, they nab their man. Abdelkader Smires, formerly ITTI's chief programmer, is still at the keyboard when they catch him at a New York college where he taught night classes. Now Smires, who pleaded guilty to charges of computer fraud and misuse in the Eastern District Court of New Ynrk, awaits sentencing.

Just another example of the private/public partnership for which the ECTF is becoming known.

The 5-year-old ECTF focuses primarily oo the New York area, but its network is expanding to include the Washington area. The ECTF, a sort of central cybercrime clearinghouse for all arms of local, state and national law enforcement, is headed by the New York office of the U.S. Secret Service and boasts a membership of 180 top federal and local law enforcement agencies and prosecutors.

While the ECTF is careful to guard its top-secret data, it also welcomes oew members to its network, which consists of about 60 companies from the private sector, mostly from the telecommunications, banking/finance and vendor/services communities.

For these private-sector groups — which are either handpicked by the ECTF or turn to the organization after falling victim to crackers — the ECTF has become the most important single point of contact and resources in the law enforcement community. It's a place to coordinate efforts, share information, review cases and learn from other investigations. It's also a way to get better and faster assistance from law enforcement when their technology is under attack.

How the Partnership Benefits the ECTF

Since its formation, the ECTF has put away large drug cartels, organized crime groups and individual crackers like Smires. The ECTF set the precedent for e-mail wiretapping, arrested 44 members of the John Gotti Jr. crime group for telecommunications fraud and tracked satellite interceptors of New Ynrk police car computer transmissions. In all, the ECTF is responsible for 788 arrests, the recovery of more than 2,000 cloned cell phones and the resolution of more than 2,100 identity thefts, all with a measly budget of $100,000, which even Weaver calls embarrassing.

But if it weren't for the assistance of those hand-selected members from the private sector, the ECTF wouldn't have nearly so much to brag about, according to Weaver, senior Secret Service special agent and point man for the ECTF.

"From the very first day we started, we worked with industry," he says. "We started with the telecommunications service providers and moved forward from there."

Weaver is the first to acknowledge that law enforcement is hog-tied by a lack of technically seasoned investigators. The Secret Service employs 125 special agents nationwide — eight of whom work out of the New York field office — who are trained in computer forensics techniques. Even though the ECTF also includes more than 100 cyberinvestigatnrs from various law enforcement agencies, including state and local police, the Drug Enforcement Agency, the U.S. Customs Service, the FBI and others, there are exponentially more criminals learning new ways to beat, cheat and exploit electronic systems.

So the ECTF surrounds itself with some of the best people in technology, which means joining forces with the private sector.

"When it comes to technology, we don't have the expertise, the right tools or the people with the right type of knowledge to work some of these cases. The private sector can give us that," says Mick Chandrani, special agent in charge of the New York Secret Service field office.

Along with technical expertise, members of the private sector make great informants.

"Our investigative ability is only as good as our information," says Bill DeArmond, a senior special agent at the Customs Service. "The private sector is an information resource, so this is the best way to cultivate information."

Perhaps the most important perspective the private sector can bring to law enforcement is a look at the bigger picture. For example, two years ago, telephone companies in the New York area started seeing huge spikes in fraudulent calling-card charges. When the fraud investigators from a half-dozen of these competing telephone companies got to-

AT A GLANCE

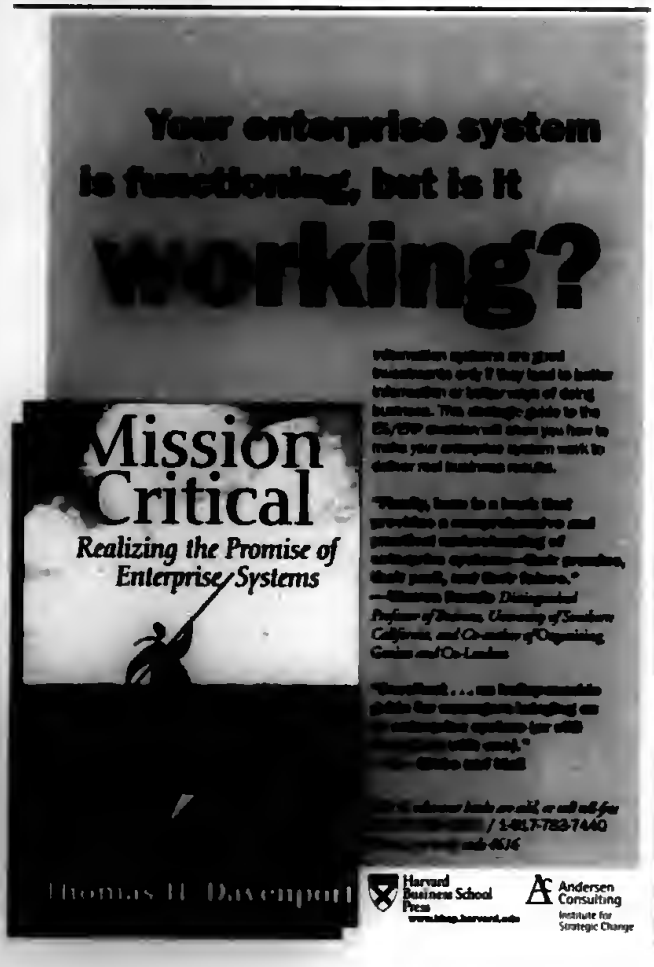
ECTF

Who: The New York-area Electronic Crimes Task Force

Headed by: The U.S. Secret Service, part of the U.S. Department of Treasury

Charter: Above and beyond its charter to protect the Treasury and the president, the Secret Service has authority to investigate any criminal acts under Title 18, Section 1029, of the U.S. Criminal Code, covering "fraud and related activity in connection with access devices," and Section 1030, covering "fraud and related activity in connection with computers."

Reference: www4.law.cornell.edu/uscode/18/1029.html





ECTF MEMBERS BOB WEAVER (LEFT) AND MICK CHANDRANI with some of the illegal IT equipment the task force has confiscated in the course of investigations

gether, they realized they were facing an organized crime ring, which was stealing calling-card numbers and personal identification numbers (PIN) from travelers at Chicago O'Hare International Airport. In this case, a suspect from the ring recorded calling-card numbers and PINs as business travelers keyed them into phones at Chicago O'Hare, theo sold them to various ethnic crime rings, which were peddling them on the streets of New York and back in their home countries.

"Once we realized we had a suspect and losses, we went to the Secret Service in New York and said, 'We've got a problem,' " says "Ralph," a fraud investigator at AT&T Corp. who asked that his real name not be used because the organized criminals in these cases are dangerous. "The Secret Service may not have known this guy was from an organized crime group, had they arrested him without our input."

What's in It for the Private Sector?

Benefits to law enforcement from such a partnership are pretty obvious — information, investigative assistance and even some free services and software. In turn, the private sector has much to gain.

"Intelligence gathering is important so that we can provide timely protection to threats and viruses," explains Dennis Batchelder, vice president of research and development at Computer Associates International Inc., an Islandia, N.Y.-based security software vendor. "The ECTF helps us know more about countermeasures and gives us access to better intelligence."

As Weaver puts it, reviewing these cases gives corporate executives a "peek under the hood" at how criminals abuse technologies, letting them better protect corporate assets and understand scams.

Indeed, this is why some 60 members of the private sector attended a filled-to-capacity ECTF operational meeting last month at the Secret Service field office in New York's World Trade Center.

"The Secret Service has taken a prominent role in financial crimes, credit-card and ID theft, all of which are stored within our secured systems. In talking to the Secret Service, we're developing a working knowledge of exposures," says James McCarthy, vice president of anti-money laundering at Citibank, a subsidiary of New York-based Citigroup Inc.

By joining the ECTF, companies are also developing a relationship with law eoforcement that reaps better, faster response when they decide to prosecute.

"The ECTF offers opportunities for private industry to voice their opinion in what cases should be brought to law enforcement. In fact, we're hoping to develop a video-signal theft case and approach Bob Weaver with it," says Andrew Brogan, senior staff supervisor of antipiracy operations at the Motion Picture Association of America Inc. in New York.

Ralph adds that the ECTF is also a conduit to other state and local jurisdictions. Since most electronic crimes cross multiple jurisdictions, this means less confusioo in processing cases.

"Before the ECTF, we would have to knock on the doors of each prosecutor in each city, state and region involved," he explains. "Now we route our cases through the task force, which, with its contacts, reaches out to other task-force members outside the state and local jurisdiction."

And because of its relationship with the ECTF, AT&T also knows where it can make up for some of law enforcement's shortcomings. For example, AT&T Laboratories can break encryption faster than law enforcement agencies can. So when investigators needed to decrypt thousands of stolen calling cards in the O'Hare case, that portion of the investigation was carried out by AT&T Labs.

Still, companies are understandably hesitant to get involved with law enforcement, let alone to prosecute cases. Weaver says there are a number of reasons companies prefer not to prosecute. But mainly, he says, companies working with the ECTF often doo't want the negative publicity, nor do they want their corporate information released to the public.

But since their involvement with the ECTF is voluntary, private-sector investigators and executives say they're not really worried about privacy issues or unwanted attention from law enforcement. In fact, Weaver says, in most cases it's better to send a public message that such crimes won't be tolerated by companies or the government.

"It's true that many companies fear letting us into their computers. But in this particular case, ITTI knew that they'd be out of business if the attack continued for any length of time," Weaver says. "They wanted to protect their clients, and they wanted to send a signal to the industry that hacks on Wall Street will not be tolerated."

Stroz, who made the decision to call the ECTF during the attack on ITTI's servers, says the company suffered very little image fallout from the attack, even though some of its customers couldn't trade for the three days the machines were under attack.

"When ITTI management was faced with the decision to call the ECTF, we were already in crisis management, which by its nature is emotional decision-making," Stroz says. "They were worried about their image. But once the apprehension occurred so quickly, the company could deal with the natural publicity that comes from arresting someone and say, 'Yes, this is our company. We were happy to see them apprehended, and we will not put up with this. And we don't think anybody else should.' "



Industry Doubts GetThere.com Plan Will Fly

BY MICHAEL MEEHAN

The verdict is still out on GetThere.com Inc.'s plan to create a business-to-business marketplace linking major corporate buyers directly with airlines, hotels and car reotals.

Officials from industry computer reservation systems say the idea holds some promise of reducing ticket costs, but they remain skeptical that the dotcom can offer enough products or customer service to force a major change in the travel market.

"In our minds, you're just replacing one intermediary for another," said Peter Stevens, vice presideot of business and product development at Sabre BTS, the business-to-business wing of Sabre Inc. in Fort Worth, Texas. "We doo't think it doesn't make sense; it just haso't proven itself out yet."

Sabre and Galileo International Inc. in Rosemoot, Ill., have spent three-plus decades as the chief technological middlemeo in the travel equation and are skeptical about GetThere's business model.

Menlo Park, Calif.-based GetThere runs business-to-business travel services for many large firms. It hopes to link major travel suppliers directly to those companies to reduce the overall costs of booking travel.



SABRE'S Peter Stevens says he's wary of GetThere

Jeff Palmer, vice president of strategic development at GetThere, said his compaoy's business clients have been pushing for this type of direct connectioo to suppliers.

Because GetThere will be providing only the connectivity for the transaction and not fulfilling the sale itself, it can offer greater savings, he said.

But Sue Powers, a senior vice president at Atlanta-based Worldspan Inc., said it's easy to promise such savings but much harder to deliver.

For example, Galileo has access to more than 500 airlines and 40,000 hotels, according to David Near, the company's vice president for Internet and e-commerce.

GetThere might be able to lower the fee normally charged by a reservation system, but it might have to spend money in other places to do so, said Near.

"That is not a trivial exercise," Near said.

Analysts reacted favorably to GetThere's announcemeot, saying they have long been waiting for a company to change the business paradigm in the travel industry.

But David Jones, interim president and CEO of Amadeus America — the U.S. wing of Amadeus Global Travel Distribution LLC in Madrid — said the distribution model of GetThere is one that bears watching.

"Do we take it seriously? Yes," he said. "Do we feel threatened? No."



The e-business transition team: Four regular suppliers. Thirty-nine



project contractors. Three outside consultants. Eighty



full-time IT employees.



Nine temporary programmers.



One person



answers to upper management: You.

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Workload, Stress Rise for IT; Firms Respond

BY JULEKHA DASH

Increasing workloads are the leading source of stress for information technology workers, according to a recent survey.

But companies seem to be addressing the problem by offering perks — such as training and additional paid time off — that enhance quality of life.

More than half of the 1,400 CIOs surveyed for a report released earlier this month by RHI Consulting Inc. in Menlo Park, Calif., cited rising workloads as the No. 1 stress factor among IT professionals. Other sources of stress include office politics, balancing work and personal lives, and commuting.

With so many IT jobs unfilled, workers are feeling the pinch, said Maria Schafer, program director at Meta Group Inc. in Stamford, Conn.

"Companies are trying to do whatever they can with the least amount of staff possible," she said.

Another problem is that IT departments are adopting systems from a variety of vendors, resulting in more complex projects and greater workloads, said Schafer.

But companies seem to be dealing with the problem. Meta Group this month released a survey of 500 compensation and IT specialists that found that companies on average have doubled their training budgets since last year. Businesses reported spending an average of $1,000 to $1,500 per employee to train IT staff this year vs. $500 to $1,000 last year.

Companies with at least 100 employees reported offering eight to 10 days of training per employee, compared with three to five days two years ago, said Schafer.

In addition to training, companies are offering flexible hours, telecommuting and additional paid time off as quality-of-life incentives, according to the Meta Group survey.

But stress factors for IT workers may vary according to industry. William Gillespie, CIO at South Central Community Health in York, Pa., said the leading source of stress among IT employees in the health care industry is from impending government regulations affecting the privacy and security of Internet health data.

Because the government has yet to issue its final guidelines or say when it will, many health care projects remain on hold, said Gillespie.

"The unknown is very stressful," he said.

AT A GLANCE

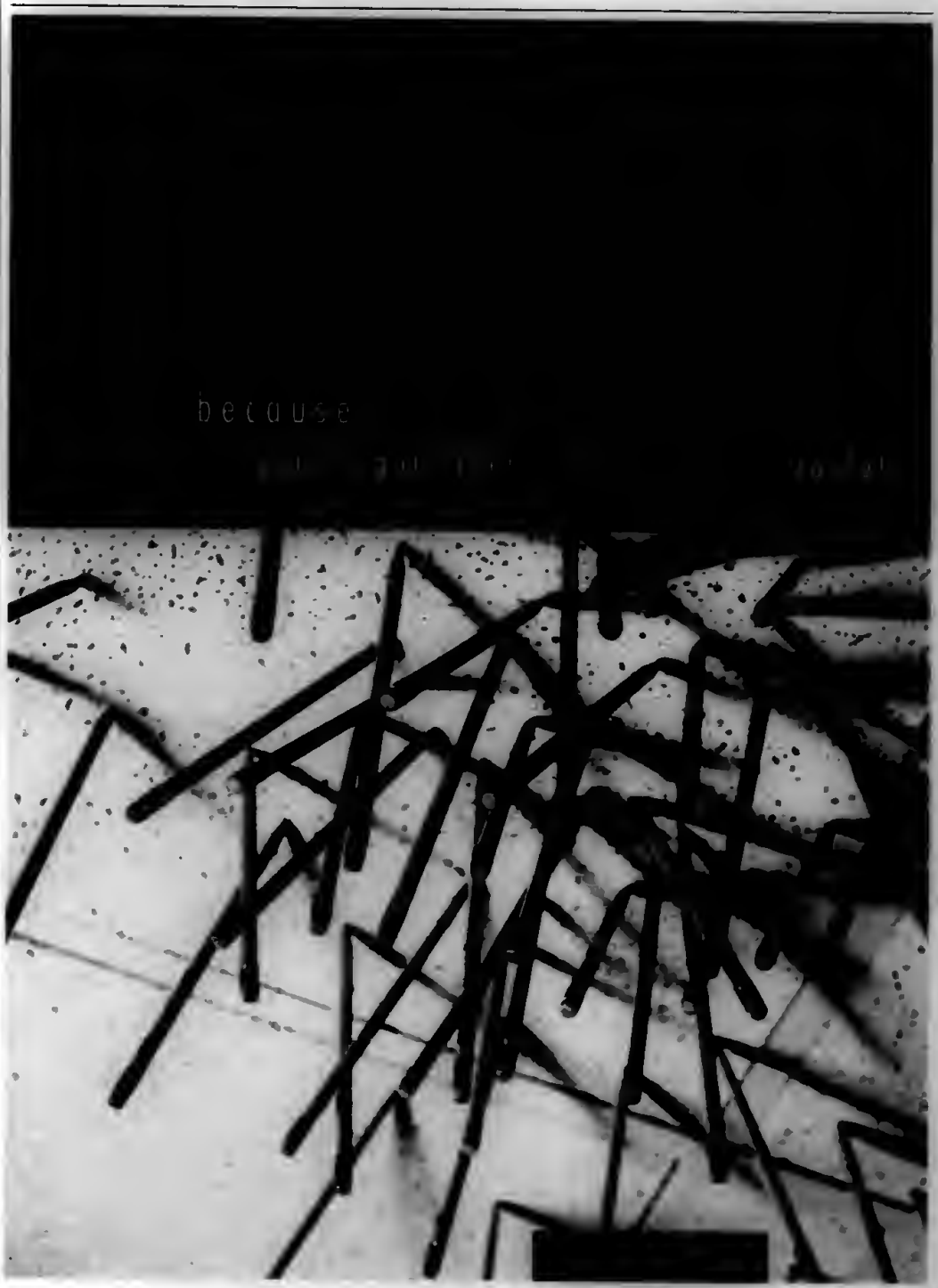
Chill Pills

Companies offering quality-of-life incentives:

Flexible work hours	92%
Training	90%
Telecommuting	67%
Additional paid time off	50%

Base: 500 compensation and IT specialists

SOURCE: META GROUP INC., STAMFORD, CONN.



WORKSTYLES

What It's Like to Work at . . .
The Metropolitan Museum of Art

Interviewee: Michael Bellun, chief technology officer
Company: The Metropolitan Museum of Art
Location: Museum Mile on Fifth Avenue in New York
Tenure: Since April 24. Originally joined the museum in 1995 as manager of office automation; left in 1996 to serve as director of information systems at the Metropolitan Opera Association for four years.
Number of IT employees: 43
Number of employees (end users): 1,500 computer users
How does IT in a museum differ from corporate IT? "We deal with curatorial departments where the emphasis would be on research, education, the arts. So it's fair to say that, unlike other organizations, our departments may not see technology as necessarily the driving force behind what they do day in and day out. They see IT as a necessary aspect of enabling them to do their work. But if we were to disappear tomorrow, their work would continue."
Major IT systems: Financial applications, "because the museum relies heavily on donations and memberships"; and a specialized collections management system known as The Museum System, which is "a repository of information on all the objects in the museum's collections. It contains a large number of images and is growing constantly as soon as we can get around to digitizing them."
New IT initiatives: "Our overall desire is . . . to share information and build a data warehouse or decision-support tool that will enhance decision-making across the organization. With that in mind, we want to retool HR and payroll, upgrade the solutions in our development and membership departments, continue digitizing information on our collection, revamp merchandising operations and last but by no means least, continue efforts to enhance and support the Web site."
What do you like best about working in a museum? "Walking to a meeting, because my walk takes me through a number of galleries. . . . You do get to a point after a while where you're just thinking about the business at hand, but then there will be a pause, and you notice that you're walking past some of the most incredible paintings of the 17th century."
Dress code: "In general, it's business, not business casual, because you are coming into contact with the public a lot more. The exception is the hands-on techies in the IT department who are on their hands and knees every day fixing problems."
Workday: "In general – is there such a thing? It's a 9-to-5 day, but we support the operation of museum 24/7, so that changes. We have three shifts in the data center, so there are people here 24 hours a day, and everyone has a beeper or cell phone, so we're always on call."
But no overtime? "We are very much in maintenance and support mode, so that doesn't call for a lot of overtime. But as we embark on some of the new strategic initiatives, that may very well change."
Kind of offices: "Right now space is very tight, but in about a month we'll be moving to a new office space that is being constructed within the museum."
Percentage of staff that telecommutes: "None at this point."
How difficult is recruiting? "The museum itself is certainly a draw. People are very proud of working here because of what the Met stands for and means to the public and to us as employees. But it would be unrealistic to think that that alone would eliminate the pressures that every IT organization feels in terms of the shortage of IT professionals. We offer competitive benefits and try to take care of employees in terms of both acquisition and retention."
Little perks: Free admission to the museum plus reciprocal free admission to other museums in the city; quarterly staff luncheons.
Quote: "This is a great place to work, and the rewards are immediately obvious when you see how the public comes to the museum – knowing you are a part of that is a great thing."

– Leslie Goff

ED YOURDON

Net legacy nightmares

DESPITE THE exhortations about the Internet's revolutionary nature, IT organizations are learning the old maxim "The more things change, the more they stay the same." Project managers have already learned that they ignore basic software engineering principles at their peril if they succumb to the pressures of "Internet time" when building a new Web application. Now we're seeing another aspect of "déjà vu all over again": the emergence of Internet legacy systems.

In the good old days, it took two to three years to develop a new mainframe application in Cobol. If you were lucky, the original developers would hang around for another couple of years, and it would take yet another couple before business conditions changed enough to warrant major software changes. Then, everyone realized they were dealing with a legacy system whose internal logic nobody understood. Today, we measure everything in dog years; thus, each stage in an application's life has been reduced to months and is developed on a "death-march" schedule so the company can be first to market. Success in the initial phase justifies an IPO (or bonuses and promotions at a more traditional company), which is when the developers cash in their stock options or bonus checks and disappear for greener pastures. Within a few months, the market has metamorphosed such that major changes are needed and nobody has a clue how the code works. Voilà — another legacy system!

Legacy systems persist in the modern world of the Internet.



We never solved this problem before, and perhaps it's naïve to imagine we can do so in the world of the Internet. But because the legacy-creating process is inevitable and the Internet's compressed time scale means that some of the original senior managers will still be around to suffer the consequences of legacy code, perhaps there will be a greater sense of urgency about minimizing the problem, if not eliminating it altogether.

In a perfect world, we would insist on a formal, disciplined analysis-and-design process, combined with meticulous documentation. But Internet-time projects are clearly not part of this perfect world, and it's unrealistic to assume we're going to see much discipline in a development effort measured in weeks or months.

But that doesn't mean we have to abandon order and discipline. Instead, the prudent project manager should focus on "light" methodologies, such as those described in Kent Beck's new book, *eXtreme Programming eXplained* (Addisoo Wesley, 2000) or Jim Highsmith's *Adaptive Software Development* (Dorset House, 2000). One of the biggest problems with legacy systems is the lack of documentation. Remember that documentation aims to transfer knowledge from the original developer to the maintenance programmer. If that programmer was part of the development team, then one of Beck's "extreme programming" concepts might equal reams of paper documentation. It's called *dual programming*: two developers work together on each application component. In the old days, we sometimes did this because we didn't have enough terminals. Now we realize that it also helps with peer reviews and knowledge transfer; for example, from a senior developer who is likely to depart when the project is finished to a junior developer who is expected to stay to help with maintenance.

Or consider videotaping all important design review meetings, joint application development sessions and other key meetings in which the system's technical aspects are discussed. Assuming that an iterative, prototyping approach is used, schedule a mini-post-mortem after each new prototype is implemented and videotape it for posterity. Use voice-recognition technology to transcribe the meetings' audio content, then index those documents so future generations can quickly track down key information. None of these strategies is perfect, but they're better than ignoring the issue. If nothing else, Y2k taught us the consequences of letting undocumeoted legacy systems live on. It would be nice if we could avoid that in the brave new world of the Internet.

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The CIO/CTO Balancing

As CIOs become more immersed in business management, some are handing off technical oversight to CTOs. But splitting responsibilities between the two roles can be tricky. By Gary H. Anthes

NEW YORK LIFE INSURANCE CO. went through four CIOs in eight years. Then, it found Judith Campbell, who had something the others didn't — a business background.

"The others were technologists," says Campbell, who arrived at New York Life in 1997 with 17 years of retail banking experience, including a stint at The PNC Financial Services Group Inc. in Pittsburgh, where she worked on projects to develop a call center and automated teller machine and home banking services. "Their lack of knowledge of what to do on the business side was part of their downfall."

Nevertheless, Campbell recognized that New York Life needed a strong technical leader, created the position of chief technology officer (CTO) and hired Mike Mazzariello to fill it in 1998. Mazzariello, whom Campbell lured from PNC, has three responsibilities at the insurance company, Campbell says: "building the IT infrastructure, managing Internet development and chief strategist for emerging technologies."

The Handoff

As CIOs increasingly take a seat at the business management table, some are handing off oversight of technical areas to a CTO. Sometimes the CTO is hired at the same level as the CIO. Other times he is hired by and reports to the CIO. In either case, the CTO is expected to tend to long-term development of the information technology infrastructure and often to oversee computer and network operations.

"The trend is definitely toward adding CTOs," says Robert Zawacki, president of IT management consultancy Zawacki and Associates in Colorado Springs and professor emeritus of management and international business at the University of Colorado, also in Colorado Springs. Technology is changing so fast, he says, that companies need a senior person who can focus on it full time and free up the CIO to focus on business-related issues. "The way I think of it is that the CTO's job is passion for the product, and the CIO's job is passion for the customer," says Zawacki.

"At many of the smartest companies we know, the CIO represents efforts to keep IT aligned with the business goals, while the CTO is the point person for making sure the IT infrastructure is sound and able to keep pace with the demands of the business," says Michael Dortch, an analyst at Robert Frances Group Inc., an IT consultancy in Westport, Conn. A company that can't afford to establish a new, senior position for a CTO "should look to grow a current team member into CTO status," he says.

Ed Hourihan is CIO at Phoenix Home Life Mutual Insurance Co. in Hartford, Conn., where he has worked for nearly 30 years. In the early 1970s, he recalls, "I had a couple of mainframe systems programmers working for me. That was the chief technology function at the time." It wasn't until the late '80s, when distributed processing came on the scene, that IT became complex and fast-changing enough to justify establishing a full-time CTO position, he says.

Like many CIOs who have come up through the technical ranks, Hourihan has shifted his focus to the business side — including cementing relationships with external customers. For technological strategy and building the insurer's long-term IT infrastructure, he relies on his CTO, Satish Bangalore, who stepped into that position in 1990.

Bangalore has a colleague at his level whom he likens to a "mini-CIO," the person who manages application development. Splitting responsibilities is not always easy, Bangalore says. "It's kind of a continuing negotiation. It's sometimes hard to draw the line where long-term architecture takes precedence over application or business needs."

For example, he and his colleague have debated selection of hardware and software for the company's Internet offerings, Bangalore says. "From a technology perspective, you might want to pick best-of-breed from start-up companies, but if you layer a management perspective or an application perspective on top of it, you'd worry about the long-term viability of the solutions you are picking."

In the debate, Bangalore ended up overriding his own people to side with the more conservative views of his application development colleague. "I take more of a management perspective than a technology perspective, even though the technologists who work for me would like to pick best of breed," he says. That philosophy may owe something to Banga-



FLEETBOSTON CTO Richard Taliani (top) and CIO Dennis Rygwalski began building their organization last year. "We work well together," says Rygwalski.

Act

lore's background: He has a law degree and an MBA.

But Bangalore is an exception among CTOs, Zawacki says. Most CTOs rise through the ranks of systems programmers and other technicians, he says. "Everyone in the company knows who they are. They are the technical gurus. The cream rises to the top."

But management skills don't hurt, Zawacki adds. He says CTOs should spend half their time on long-term strategy and half on short-term oversight of key projects. He cites a Midwestern bank where the CTO devoted much of his time to ensuring that a crucial electronic banking project stayed on track. "There was a project manager for the project, but the CTO was joined with him at the hip," Zawacki says. The project was pulled off successfully, says Zawacki, because the CTO had "such respect in the organization that he was able, through leadership, to just drive it harder."

Hourihan says Bangalore played a decisive role in one mission-critical project: combining the IT operations of Phoenix Home Life and another insurance company when they merged in 1992. Bangalore effectively combined six incompatible policyholder systems into one in just five months "by screen-scraping" data from each and funneling the information into a common front end. Without that, the customer call center would have been in chaos, Hourihan says. "It was very clever, and he did it very quickly."

New York Life's Campbell has formed a troika of senior IT managers immediately below her. In addition to the CTO, there is a manager of applications development and a manager of administration and operations. The three make for "a plan, build and run environment," she explains.

Yes, There Are Conflicts

Campbell acknowledges that her CTO's high-tech mission sometimes pits Mazzariello against the more conservative applications and operations chiefs. "Some of the decisions I have to make can be unpopular and the CTO might not like them," she says. "On the other hand, I may be pushing the operations people beyond what they think are their capabilities, but then we go outside and get some help."

Recently, Campbell says, such a dispute arose over selection of middleware, with the CTO recommending state-of-the-art products but operations staff arguing they were too risky. Campbell steered the factions toward a middle-of-the-road alternative, then got some outside help installing the software. "It was a good compromise, but the two camps were not going to get there without some mediation," she says.

"Any disagreements we may have involve the speed of change that is desired," explains Mazzariello. "It is Judy's role to look at the big picture and how to implement technology strategy while considering budget, cultural readiness and so forth. I look at things primarily from a technology standpoint."

When BankBoston Corp. and Fleet Financial Group merged last year to form FleetBoston Financial Corp. in Boston, neither company had a CTO. But the merger introduced so much business diversity and technical complexity that a CTO position was created, with both the CTO and CIO reporting to the vice chairman. "There was the realization that there were two very major and complementary jobs that needed to be performed in a large and complex organization," says FleetBoston CIO Dennis Rygwalski.

Each position includes short-term operational duties as well as responsibilities for long-term strategy formulation, Rygwalski says. "Mine are more applications systems-oriented and business-oriented, and his are more infrastructure-oriented."

Conflicts that arise between short-term and long-term goals — and between business objectives and infrastructure needs — are generally resolved through a methodology called the New Business Initiative (NBI) process, says FleetBoston CTO Richard Taliani, executive vice president of global technology services at the $191 billion bank. When the bank is considering any significant change in its use of IT, it uses a cross-functional team to evaluate it and make recommendations to senior IT management. The 12- to 15-person team includes representatives from Rygwalski's and Taliani's staffs and from the information security organization. "The team gathers requirements, does costing, does configurations, looks at the underlying technology," Taliani says. "It filters out potential ambiguities and conflicts."

But when it can't resolve a conflict, or when the team wants to deviate from Fleet Boston's IT standards, the question is put to a six-person group of IT executives called the Strategic Architecture Committee, chaired by Rygwalski and Taliani. "The SAC is kind of like the Supreme Court, and we go through a voting process if it comes to that," Taliani says.

"The NBI process is both our blessing and our downfall," Taliani says. "It's a very cleansing process and it drives people to closure and consensus. But it's also a little bit lengthy and cumbersome. We are trying to streamline it so we can get product to market faster."

Rygwalski says he and Taliani worked well together to combine the CIO's 900-person group and the CTO's 850-person group. "We took the time, when we built the organization, to understand the roles and responsibilities of each of us," he says.

The CTO's Role

Although internal definitions and perceptions of the CTO's role may vary, Robert Frances Group Inc. in Westport, Conn., suggests these responsibilities for enterprisewide CTOs:

- **Define, develop and deploy** an IT architecture that maximizes revenue, minimizes costs, helps get and keep IT aligned with business goals and provides a firm, flexible foundation for the future.
- **Ensure** that all IT deployments are properly implemented, integrated and supported.
- **Become** the corporate subject-matter expert on all trends and developments in IT that are relevant to business.
- **Oversee** compliance of the corporate IT resource with relevant standards and appropriate best practices.
- **Develop** ground rules, performance criteria and enforcement mechanisms for service-level agreements with relevant IT service providers.
- **Keep** other IT team members and senior managers aware of the value of the IT architecture and implications of proposed changes or additions.
- **Help** educate end users on the value of the IT architecture to the business and their roles within it.





BENEFIT BONANZAS AND THEN SOME

100 BEST PLACES TO WORK IN IT

When it comes to basic job perks, IT pros want them all — plus a fat paycheck. The Best Places to Work use that as a starting point and throw in some unusual offerings to really sweeten the pot.

By Matt Hamblen

CIOS EVERYWHERE are racking their brains to find the right mix of bonuses, compensation and modern benefits to lure and retain scarce information technology workers. Meanwhile, Harleysville Group Inc. still sees value in a tried-and-true 1950s-era perk with charm.

Every workday at 9:30 a.m. and at 2:30 p.m., someone wheels a snack cart through Harleysville's office areas, stopping for 10 minutes at a time to dispense coffee, doughnuts and mental health.

"People are able to get up from their desks, and the carts have a water-cooler effect that breaks up the day," says James Breidenbach, assistant secretary for IT at the Harleysville, Pa.-based company. "Whenever people leave the company, the thing they say they miss years later is the break cart."

An Array of Benefits

Aside from that novelty, Harleysville offers an array of benefits to lure and retain IT workers. This includes an attractive 401(k) plan that features up to a 100% match when an employee contributes up to 6% of his salary to the plan. The company has made 100% matches for the past three years, based on company financial performance.

Such 401(k) matches are common benefits at many IT shops, but companies seldom match at 100% and usually at only 50%, according to reviews of companies in *Computerworld*'s Best Places to Work survey.

Other common benefits are telecommuting options, flexible hours and overtime pay or comp time, companies in the Best Places to Work in IT survey reveal. Employee stock-ownership plans are also common, and sometimes companies vest workers fully from the start, with the employer paying from a small percentage up to full cost.

> *Today's IT employees want it all in terms of benefits, along with fair compensation. But more critical to employees is to feel they have good leadership with interesting and challenging work.*
>
> PAMELA HANSEN-HARGAN, VICE PRESIDENT OF HUMAN RESOURCES AND SECURITY, LOCKHEED MARTIN MANAGEMENT & DATA SYSTEMS

RadioShack Corp. in Fort Worth, Texas, set a company record for matching 401(k) contributions at 159% — on top of matching up to 80% of the cost of RadioShack stock purchased by employees and offering salaried employees stock options (see "Stocking Up Against Dot-coms," page 55).

"Today's IT employees want it all in terms of benefits, along with fair compensation," says Pamela Hansen-Hargan, vice president of human resources and security at Lockheed Martin Management & Data Systems in Philadelphia. "But more critical to employees is to feel they have good leadership with interesting and challenging work."

Hot Incentives Include Concierge

One of the hottest new benefits at Lockheed Martin is a concierge service that works just like those at hotels. You want car service? You can call the concierge, who arranges for a company to change your car's oil in the company parking lot. You want to go on vacation? Name your budget and the concierge service finds the best deal. All services are free to the worker.

Hansen-Hargan says child-care and elder-care emergencies are also handled by the company so that a valuable worker can make it to a critical meeting the next day.

Flexible work hours have proved very popular, but the program was set up with the warning that abuses wouldn't be tolerated, especially because Lockheed Martin is a government contractor.

Benefits at Lockheed Martin are judged not only against what other companies offer IT workers, but also on whether they help lower attrition, create

better leaders or improve productivity Signs of improved productivity might be an increase in the number of lines of code written or a decrease in the number of bugs in code.

Lockheed Martin has a semiannual bonus program that is tied to employee performance. But the company has found that bonuses don't produce the highest return on investment: They work best at improving performance on a project but don't change the overall job experience.

"We are a people-driven business, and we've found a bonus provides a short-term return. But for the long term, creating a good work environment helps retain talented people," Hansen-Hargan says. Benefits such as the concierge service create a better work environment that deals with the whole worker and lowers stress to improve performance, she says.

Bonuses Tied to Objectives

Lockheed Martin's approach contrasts with that of DPR Construction Inc., where bonuses are central motivators. Budgeted at 12% of base salaries annually, bonuses are awarded when workers achieve preset objectives.

The Redwood City, Calif.-based company has only 28 IT workers for 2,200 end users nationwide in a business with annual revenue exceeding $1.2 billion. "Bonuses are the most meaningful to our workers because they are real cash to workers," says Les Fondy, who describes himself as the "head nerd," equivalent to CIO, at DPR.

The value of bonuses is high in terms of return on investment for the company because they're tied to performance objectives and to the level of communication between worker and manager. "The workers know what it takes to get something better with bonuses," Fondy says.

DPR measures the success of bonuses partly by the amount of value the IT workers create for end users in the construction of new buildings. There is a feedback loop that gives Fondy and others a pretty good sense that the bonuses are motivating IT workers and therefore satisfying the end users of the technology. "Happy employees generate raving [end-user] fans," Fondy says.

"People do look at these bonuses as important, and I personally find them very appealing," says Lee Rockledge, a network manager at DPR who also manages five workers.

But Rockledge says he and other workers also give high ratings to flexible work hours and an in-house fitness center. And Rockledge says another big plus is DPR's willingness to add features to its medical and dental plans, including $1,000 worth of orthodonture coverage, which is important to Rockledge because he has children.

Still, traditional IT shops are hard-pressed to hold on to top-level workers who are lured by dot-coms and their stock-option plans. "At a brick-and-mortar shop, you have to provide the workers real money because they won't get the multiples [on stock values] they would at the Internet companies," says Craig Bickel, vice president and CIO at Cabot Corp., a chemical company in Boston.

But Bickel defines *real money* as much more than lucrative bonuses or rich benefits. "I haven't lost a lot of people, but I've lost some leaders who have gone to Internet companies for a flat salary increase and a gamble on equity in the new company," he says. "They tell me, 'I just have to grab the brass ring.' "



"THERE IS A LOVE AFFAIR of all Americans with stock options," says Evelyn Follit, senior vice president and CIO at RadioShack

Stocking Up Against Dot-coms

RadioShack offers stock options, partly as a hedge against the lure of dot-com companies, but the company views the options as part of a full buffet of benefits, bonuses and compensation based on its goal to be the best company to work at in the U.S.

"There is a love affair of all Americans with stock options," says Evelyn Follit, senior vice president and CIO at RadioShack, which was known as Tandy Corp. until undergoing a name change in May.

"Some of the dot-coms are so rich that we'd be insulting people with counteroffers, but we are able to intercede and help in some cases," she says.

While turnover is low at RadioShack, when people do leave, "money is the not the driving force" in all cases, says Bob Gellman, vice president of online strategies. "We've found out that, in a few cases, it was something they were unhappy with, and we put together an action plan that addressed their needs and it worked."

Last year, the company launched a companywide benefits review involving hundreds of workers and their spouses that has resulted in many new quality-of-life benefits, including a Lifeline crisis service staffed by licensed counselors and "guilt-free vacations," where workers are told not to read e-mail or call the office. – *Matt Hamblen*

Top 10

Best Places to Work in IT for benefits:

Rank	Company name
1	Cabot Corp.
2	Autodesk Inc.
3	RadioShack Corp.
4	DPR Construction Inc.
5	Lockheed Martin Corp.
6	The Home Depot Inc.
7	United Stationers Inc.
8	Harleysville Group Inc.
9	T. Rowe Price Associates Inc.
10	GATX Rail

Benefits offered by the Top 100 companies:

Flexible hours	97%
Employee performance bonuses	96%
Company matching 401(k) plan	92%
Telecommuting options	91%
Profit-sharing program or ESOP	85%
Overtime pay	76%
Comp time for overtime hours worked	64%
On-site fitness center or membership reimbursement	59%
Elder care	47%
Company-subsidized child care	42%
On-site child care	30%
College tuition reimbursement	29%
Technology certification reimbursement	19%
Benefits for spousal equivalents	17%

INDULGING OUR DIFFERENCES

100 BEST PLACES TO WORK IN IT

Whether successful diversity is the goal of a great work environment or merely a by-product, the action plan is the same — recognize each employee as a valuable asset with unique needs.

By Kathleen Melymuka

A YEAR AGO, applications development manager Nancy Gray needed to help care for her mother, who was dying. Her employer, Home Shopping Network (HSN), allowed her to work from home and gave her paid time off as needed.

The month after her mother died, Gray's mother-in-law was diagnosed with cancer, and Gray needed to help care for her as well. Again, her boss was flexible. "I really appreciated that because otherwise I wouldn't have been able to deal with it," Gray says.

While elder-care responsibilities often fall to women, Gray's situation could have happened to anyone. That points up the No. 1 lesson from companies that excel at workplace diversity: "It's not about how you treat women or minorities," says David Aldridge, executive vice president and CIO at the St. Petersburg, Fla., retailer, a unit of USA Networks Inc. "It's more how you treat hardworking people."

Officials at *Computerworld*'s Best Places for diversity hiring and career development disagree about the main reasons for their companies' success in this arena.

Some insist that diversity has to be a top corporate priority. "The very first thing to do is sit with the CEO and find out where his or her heart really is," says Tom Murphy, CIO at Royal Caribbean Cruises Ltd. in Miami. "I'd walk away from any company that doesn't believe that diversity will make or break an organization."

"We talk about this every single week," says Dennis Klinger, CIO at Florida Power & Light (FPL), an energy utility in Juno Beach, Fla., where the information technology turnover rate is an enviable 5.5%.

Quality of Work Life

Others say diversity is a by-product of a great work environment. "I don't focus on diversity," says Cora Carmody, CIO at top-ranked PRC Inc., an IT services company in McLean, Va., that's a subsidiary of Litton Industries Inc. "I look for a quality of work life that will attract the most talented individuals. It happens to have attracted a highly diverse workforce both in ethnicity and gender."

"I would love to be able to say there's a calculated strategy here, but we do not have a formal program to recruit diversity," echoes HSN's Aldridge. "We're looking for the best talent we can get."

But whether their goal was to build a great work environment or a diverse workforce, Best Places used a lot of the same tactics. By working toward either goal, companies can make progress toward both. Here's how:

■ To get the best people, cast a big net. "There's a wider selection of great people if you look more broadly," says Klinger. "It's the right thing to do, and it's also good business."

■ Take specific steps to be sure opportunities are available to all. At Royal Caribbean, Dedra Paul was hired two years ago to serve as a dedicated diversity leader. "But the environment was already in place," she says, because "senior leadership is extremely committed."

That environment includes a month of diversity, sexual-harassment and values training early in the tenure of every employee, to "make them aware of and appreciate what the guy next door brings," she says. "It takes a multipronged effort with training and development and keeping an eye on compliance issues like who's getting promoted and whether salaries are compatible. It all has to work together."

Two years ago, American Management Systems Inc. (AMS), an IT consulting firm in Fairfax, Va., launched an initiative to attract and retain diverse talent. To do so, the company is examining programs in leadership development, technology, training and career development and promoting companywide employees who support broader opportunities, says Karen Powell, who heads the initiative, called AMS University.

At AMS, *diversity* means "all the differences we need to manage," says Powell, citing work styles, skills and ways of thinking as well as race, ethnicity and gender. "We try to promote programs to help people value the differences we all bring," she explains.

■ Once you find talent, stretch it. When Dennis Wright's manager left Royal Caribbean, Murphy asked the young African-American network engineer to step in as acting manager of his department, even though he'd been at the company less than a year. "There was a level of uncertainty about how [former peers] would respond," Wright recalls. "But they overwhelmingly supported me from the first day."

Wright earned the position permanently. "I look at him not as a person of color but as a resource with the chops to step up and show what he was made of," Murphy says. "He proved that he had what it took."

By its nature, flexibility is hard to



define, but employees know it when they see it. For example, Royal Caribbean grants employees seven personal days in addition to core holidays to accommodate diverse religious and cultural requirements. But a key manager in the IT group needed more. She had a child with health problems, so Murphy allowed her to work from home three days a week.

When Klinger was recruiting a woman for a senior position in FPL's IT shop, be found she was a single mother with concerns about her ability to be available to her 10-year-old daughter.

"She wanted to be home when she needed to be, to be involved in school functions and wheo ad hoc things came up," Klinger recalls. So he made that understanding part of the job offer and gained "a dedicated employee who gets the job dooe."

■ Make family priorities your priorities. Most Best Places offer subsidized child care, and Royal Caribbean has an on-site day-care facility.

"It makes sense that people can go and have lunch with their children or rock their babies at lunch hour," says Paul. "It makes this a much more relaxed atmosphere for parents."

When Carmody took oo the CIO role at PRC in 1996, she inherited an IT department with severe morale problems. She turned that around by spotlighting flexibility and family.

"Being a mother of four who had oursed all four of them while I was working, I have a different perspective than a lot of CIOs," she says. IT turnover has shrunk from 39% to 10%, and 80% of IT workers have stayed on the job five years or more.

■ Get the word out faster with some targeted recruiting. Diversity might happen anyway, but AMS has pushed things along by establishing close relationships with minority professional organizations, such as the Society of Hispanic Professional Engineers and the National Society of Black Engineers, and with historically black colleges and universities.

FPL advertises job openings in publications that target female and black engineers. It also supports scholarship and intern programs at Florida A&M University. Recently, a black female IT manager worked with Florida A&M faculty to present real business problems to a technology class. "When it comes time to recruit, we know each other," says Klinger. Black IT workers also recruit, be says. "When black professionals are willing to put their own names and personas behind a recommendation for people to come here, that says a lot."

Andrea Pelt Campbell, a customer billing systems manager at FPL, has done that kind of recruiting. "The challenge for us as a company is not as much to recruit based on diversity, but to get qualified talent that will deliver," she says. "To be the best, you want the best, regardless of ethnicity."

Campbell says her pitch to job candidates is that FPL is "a very innovative company in terms of technology and the way we use information systems" and that the diversity angle is almost an afterthought. "I advise them that we are interested in promoting diversity within the business units and all creativity is embraced," she says.

Best Places also recruit from within. "IT has been a wonderful next step for folks in other parts of the organization," says PRC's Bohlman, who notes that several minority employees from the mailroom, security and facilities departments have been trained and moved into IT careers.

Domingo Gascon, a desktop integration specialist originally from Puerto Rico, was working in internal security at PRC and looking to move up when his manager told him about an opportunity for an IT internship on the desktop integration team. He interviewed and was selected, then worked a couple of mornings a week learning the ropes in IT while maintaining his security job.

Four months later, a desktop integratioo specialist job opened up, and Gascon competed with other candidates and won the position. "I was looking for opportunity, and when it came, they belped me pursue it and move on," he says. "Now the sky's the limit."

■ Coach or mentor every oew hire. Most Best Places provide peer coaching or mentoring to all new hires to provide guidance, to help them get acclimated and to develop their technical expertise and leadership. At FPL, IT human resources manager Debbi Gray says each coach has worked on the same types of projects and faced the same types of work issues as the new hire but is not necessarily of the same gender or ethnicity.

Success in diversity leads to more success. "As minority staff see additional minorities hired, that demonstrates a commitment to inclusiveness which is important for them," says Johnnie Lawton, vice president of minority recruiting and diversity initiatives at AMS. "The more of them they see, the more they think this is a nice place to be."

And great work environments tend to self-perpetuate. "I try to grant my people the opportunity to take the time they need for the personal things in their lives," says Nancy Gray, the woman who cared for her dying mother and mother-in-law. "I try to be as compassionate as my supervisors are with me."

Whether through planning or serendipity, the Best Places have learned the secret of diversity. "If you doo't make each and every individual feel welcome, the ones that are the most different will leave," Carmody says. "But if each person feels welcome and trusted and at home, they'll bring their friends in."

Top 10 *Best Places to Work in IT for diversity*

Rank	Company name	% of female IT staffers	% of female IT managers	% of minority IT staffers	% of minority IT manager
1	PRC Inc.	51%-60%	51%-60%	46%-50%	6%-10%
2	Royal Caribbean Cruises Ltd.	31%-35%	31%-35%	41%-45%	51%-60%
3	Fannie Mae	41%-45%	41%-45%	41%-45%	26%-30%
4	Federal Express Corp.	46%-50%	31%-35%	36%-40%	21%-25%
5	Silicon Graphics Inc.	36%-40%	16%-20%	61%-70%	31%-35%
6	American Management Systems Inc.	41%-45%	36%-40%	36%-40%	16%-20%
7	Edison International and Southern California Edison	36%-40%	21%-25%	46%-50%	26%-30%
8	Florida Power & Light Co.	31%-35%	31%-35%	41%-45%	31%-35%
9	TECO Energy Inc.	36%-40%	46%-50%	16%-20%	21%-25%
10	Allstate Insurance Co.	41%-45%	36%-40%	26%-30%	21%-25%

Subordinated Debt

DEFINITION

Subordinated debt: The business equivalent of a second mortgage, often used for corporate buyouts or acquisitions. The stakes are high, because if a company goes bankrupt, subordinated debt lenders are at the end of the line when assets are divided up. As a result, interest rates are high, and subordinated debt providers are highly cautious about granting loans.

BY MARIA TROMBLY

A YEAR AGO, Dennis Deegan, CEO of Warner Power LLC, and four other top managers at the Warner, N.H.-based transformer manufacturer came up with a plan.

Warner Power's parent company, WPI Group, had recently shifted into the handheld computer terminal market, so Deegan and his fellow managers thought the time was ripe to buy out the company and go independent.

But, Deegan explains, "we needed quite a bit of money to do the deal, and we couldn't get it all through senior lending sources," which would have required collateral.

"We wanted to retain as much of the ownership of the company within the five key individuals that were involved," says Deegan, so they didn't want to sell equity in the new firm.

So the group turned to subordinated debt, also known as mezzanine debt, a form of financing akin to a second mortgage on a house. With subordinated debt, lenders have less recourse if a firm goes bankrupt because the senior debt lenders are first in line when the assets are divided. As a result, interest rates are higher, and borrowers must pass an extensive credit check in order to secure such loans.

For a typical midsize company, 15% to 30% of a corporate buyout will be financed by subordinated debt, with primary financing in the form of senior debt backed by collateral, says Malon Wilkus, CEO of Bethesda, Md.-based Capital.com Inc., an online clearinghouse that matches subordinated debt borrowers with providers.

Unlike senior debt, which is a relatively safe investment, subordinated debt requires a close relationship between lender and borrower, according to Todd Eyler, an analyst at Cambridge, Mass.-based Forrester Research Inc.

As a result, this particular marketplace is very illiquid, he says. Each loan is unique, and lenders have to be extremely cautious about each deal.

Fast Financing

Traditionally, finding a subordinated debt lender could take several months, but Warner Power took a shortcut by logging on to the Internet.

"From the time we started looking to the time we got a deal was a matter of days," says Warner Power President Dick Longo. "It really worked. In fact, it worked so well that, right as we speak, we're going through another small acquisition, and it's working again."

Longo turned to Wilkus' Capital.com, which matched Warner Power with its new lender.

It still took a few months from the time the deal was signed to the day the check was in hand. But Capital.com helped tackle the first half of the problem — the time it takes to find a lender.

A lot of midsize firms never find the financing they need in time to make the deal because it's so hard to track down the right provider, says Wilkus.

"Wall Street is only geared toward the largest firms," he says. "It's the last remaining inefficiency in the financial market."

Capital.com's parent company, American Capital Strategies, saw an opportunity in that inefficiency and spun off the Internet firm to link borrowers to providers of subordinated debt.

Subordinated debt is often used by companies looking to expand or buy up a competitor, says Mark Opel, chief operating officer at Capital.com.

"It allows you to raise additional financing that is less expensive than equity and that doesn't have that dilution in ownership," he says. "When you need more than what the bank will lend you, it tends to be the most cost-effective source of financing to fill that gap."

Some Skepticism

But traditional subordinated debt providers say they're skeptical about the Internet-based model of financing for this market.

"I have my doubts," says Lee Haskin, CEO of New York-based Haskin & Associates Inc., which placed $235 million in subordinated debt this year.

"Senior debt is like the first mortgage," he says. "It's more black and white. You look at the value of the property, see whether the borrower can afford to service the debt. It's more simplistic. With subordinated debt, it requires so much more relationship involvement. The lender isn't really protected, so they have to look at where the company is going."



WARNER POWER'S DICK LONGO says going through Capital.com "worked so well that . . . we're going through another small acquisition"

Haskin says he's seen other players try to create a subordinated debt marketplace on the Internet and fail because it's hard to describe a deal adequately in a fill-in-the-blanks form on the Web.

An intermediary that knows the company, knows the company's management and understands the industry is critical, Haskin says.

"It's so subjective," he says. "And a hands-on relationship is important."

If Capital.com is able to develop relationships of trust and deep communication with borrowers and lenders, then it might work, he says.

"But how much information can you really get over the Internet?" he says.

JUST THE FACTS

Subordinated Debt Financing

Uses of subordinated debt:

- To refinance existing loans
- To meet balloon payment obligations
- To help fund a management or employee buyout
- To help fund turnaround requirements

Other Types Of Financing

EQUITY FINANCING

- Borrowing against the worth of the company itself. Equity financing incurs the greatest risk of all on the part of the investor. Equity investors demand high returns, commensurate with that risk.

REAL ESTATE FINANCING

- Borrowing against property. Commercial real estate financing can take the form of senior or subordinated debt and comes with fixed or variable interest rates.

REVOLVING LINES OF CREDIT

- These are the most common and least expensive forms of borrowing for small and midsize companies. Borrowers typically get revolving lines of credit to fund their working capital.

SMALL BUSINESS ADMINISTRATION LOANS

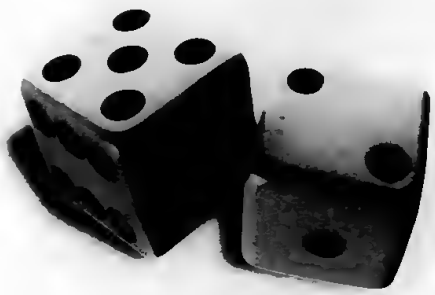
- The 7(a) Loan Guaranty Program is one of the primary lending programs of the government's Small Business Administration. It guarantees loans to small businesses that are unable to secure financing on reasonable terms through normal lending channels.

SENIOR TERM DEBT

- Senior term debt is the second-most common form of financing for small and midsize companies. Senior term debt is typically loaned against the collateral value of property, plants and equipment.

Are there business terms you would like to learn about in QuickStudy? Please send your ideas to quickstudy@computerworld.com.

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Dear Career Adviser:

The headhunter I'm working with has arranged a first interview for me with a company on the other side of the country for a chief technology officer job. It's a video interview that will be done at Kinko's. How do I prepare?

— WILLING TO WING IT

Dear Willing:

Video interviewing is exactly how SpringStreet Inc., a San Francisco dot-com, arranged its first interview with its then-New York-based chief technology officer, so don't underestimate the seriousness of the contact and do prepare.

You'll need to understand such things as transmission rates, how close to sit to the camera to appear without distortion and whether the equipment being used can handle integrated presentation tools such as PowerPoint and Internet browsers. It would also be worthwhile to study some body language and speaking guidelines so you don't look like you're hyperactively bobbing and weaving. Get a copy of Joyce Lain Kennedy's *Job Interviews for Dummies*, 2nd edition, and pay particular attention to the material on video interviewing.

Last, rehearse speaking in sequence, where each person finishes a sentence completely before the next person begins.

Dear Career Adviser:

My background is in math. I originally started working designing and programming scientific systems, first for NASA satellites and then for the U.S. Navy, working in Fortran and Assembler.

For a higher salary, I switched to commercial databases using PL/I and IMS and then to database administrator work for IMS, DB2 and Oracle. I would really like to return to scientific system development. How will potential employers view my Oracle and other database work? — SCIENCE SAYS

Dear Science:

You should be sitting in the catbird seat for some of the newer big scientific computing projects, according to Jim McGraw, associate editor at *Scientific Programming*, because your strong database background makes you an excellent fit.

For example, Lawrence Livermore National Laboratory is doing work on the human genome project, which focuses on merging the contents of some 500 different online databases regarding the human genome into one logically coherent information source. And NASA Ames Research Center is concentrating on satellite data and where to put data pouring down from the sky.

Additionally, government lab/private start-up collaborations are forming companies like Dreamtime Holdings in Mountain View, Calif., which is working on converting NASA's archives into a multimedia database.

In short, more sites now are recognizing the value of relational and object-relational models for handling complex data analysis, plus you're a prime candidate for work on experiments that focus on data capture, post-processing and analysis.

There's another positive change in programming scientific systems, advises McGraw. Although Fortran is still a favorite language, other languages (such as C, C++ and even Java) and the Web are gaining acceptance as the Internet becomes an important vehicle for scientific collaboration.

For leads to scientific computing jobs that emphasize all of your experience, including database work, take a look at the job listings at *www.lanl.gov/*. You'll see a number of postings where skills in database technology are either required or highly desirable.

Dear Career Adviser:

Our small new-media company is being acquired. The acquiring company has an aggressive growth plan, which for the moment means we will all stay on. The new compensation packages mention ownership, base salary and bonus, mostly for senior management. I'm a developer who has been here for three years.

We're meeting with the new management next week, and I want to make sure I negotiate correctly and have some job security in the acquisition. — NEWLY ACQUIRED



Mary Gurtler is an expert in high-tech careers and recruitment. Send questions to her at www.computerworld.com/career_advisor.

Dear Acquired:

Although owners and senior managers with contracts will likely be treated differently, your job security seems unlikely, says Jeffrey S. Sloan, an attorney at Sheppard, Mullin, Richter & Hampton LLP in San Francisco.

Generally speaking, in acquisitions of small companies by small companies, all employees can be treated however the acquiring company wants, consistent with any previous employment contract that the employee might have.

Therefore, barring discriminatory practices, some employees can be kept on; others can be let go. Some can be given a contract; others can be kept "at will."

Under all circumstances, though, all employees are entitled to be paid all owed salary promptly and also for accrued but unused vacation. And if you aren't being hired by the new company, you'll be able to continue health insurance and other benefits through the 1985 Consolidated Omnibus Budget Reconciliation Act.

Consult an attorney about stock plans, because the acquiring company could handle your current options in a variety of ways. Finally, maybe you'll get lucky and the acquisition will trigger an immediate full vesting of the options you currently hold. ▶

BRIEFS

Salvage Assets Exchange Planned

An online auction and exchange site – iSalvex.com Inc. – is due to go live this month with the goal of bringing together insurance companies that want to sell recovered salvage assets. Such companies compile a market segment estimated to be worth more than $36 billion per year. The Andover, Mass.-based site's initial private investors include more than a dozen executives from the insurance, investment and Internet industries, including Dick Sabot, founder of Tripod Inc. and eZiba.com and a board member at Waltham, Mass.-based Lycos Inc.

Web Recruiting

A good Web site may be a key asset for employers looking to hire recent college graduates. According to a survey of more than 1,000 college students conducted by Jobtrak Corp. (*www.jobtrak.com*), a college recruiter in Los Angeles, more than 75% of students said the quality of employers' Web sites affected their decisions of whether to apply for jobs at the companies.

Security Site Unveiled

Ernst & Young International's Global Security Solutions Center in Kansas City, Mo., last week launched a security portal and subscription service called eSecurityOnline.com. The portal is being pitched as a one-stop shop for security services ranging from free alerts, downloadable tools and job postings to customized, subscription-based vulnerability studies and recovery services. Ernst & Young has been beta-testing the service with select customers for more than two months.

Winery Outsources

Wine.com Inc., an online wine merchant in Napa, Calif., recently selected SiteSmith Inc., a provider of outsourced Internet site operations in Santa Clara, Calif., to manage all aspects of its Web site and corporate network upgrade for improved performance and scalability. The new network aims to consolidate Wine.com's systems at a single location for easier management, better control and lower costs.

New Exchange?

Though not yet approved by the Securities and Exchange Commission as a stock exchange, Chicago-based network Archipelago LLC (*www.tradearca.com*) has launched a national ad campaign touting itself as a better conduit for information than traditional exchanges. In March, the Pacific Exchange announced a plan to create the first fully electronic national stock exchange for New York Stock Exchange, American Stock Exchange and Nasdaq Stock Market Inc. stocks. Archipelago will function as the equity marketplace of the Pacific Exchange after SEC approval.

State Probes Brokers

Virginia's division of securities and retail franchising has asked online brokers – including Charles Schwab & Co., ETrade Group Inc. and Ameritrade Holding Corp. – how they guide customers in making investments. Last week, a General Accounting Office study suggested that online brokers do a better job than traditional brokers of educating investors about the risks associated with stock trading.


clog your network with spam and huge attachments. Or disable you
with viruses. E-mail exposes your network to a variety of performance problems that can send
the drain.
enables you to automatically block undesirable e-mail attachments from
entering or
. You'll also protect your company from legal
liability by
circulation of offensive e-content.
If e-mail is the lifeblood of your company, rely on Content
Technologies
it flowing.
content
technologies

THERE'S NO DEARTH of technology to help deliver personalized content to Web sites and to deliver targeted promotions via e-mail. Users have plenty of choices, from the template-driven packages of BroadVision Inc. and Vignette Corp. to the more flexible development platforms of Art Technology Group Inc. and Blue Martini Software Inc. There are also site analysis tools, profiling systems, data analytics engines and collaborative filtering products. But analysts caution that software alone can't solve the personalization problem. Careful assessment of customer needs and business models are just as critical.

"Personalization is not something you buy out of a box," says Chris Selland, an analyst at The Yankee Group in Boston. "It's something you do."

It seems everyone wants to customize online content for individual customers. But should you trust an off-the-shelf personalization tool, build your own or just outsource the whole thing? By Carol Sliwa

Personalization: BUY, BUILD OR OUTSOURCE

Garden.com: BUILD AND BUY

DELIVERING PERSONALIZED content was no afterthought for Garden.com Inc. The Austin, Texas-based retailer went into business thinking it could become the virtual gardener for each of its customers.

But when the site launched five years ago, Garden.com didn't find the commerce engines and personalization packages now on the market. So staffers built their own proprietary commerce engine with extensive customer tracking in mind.

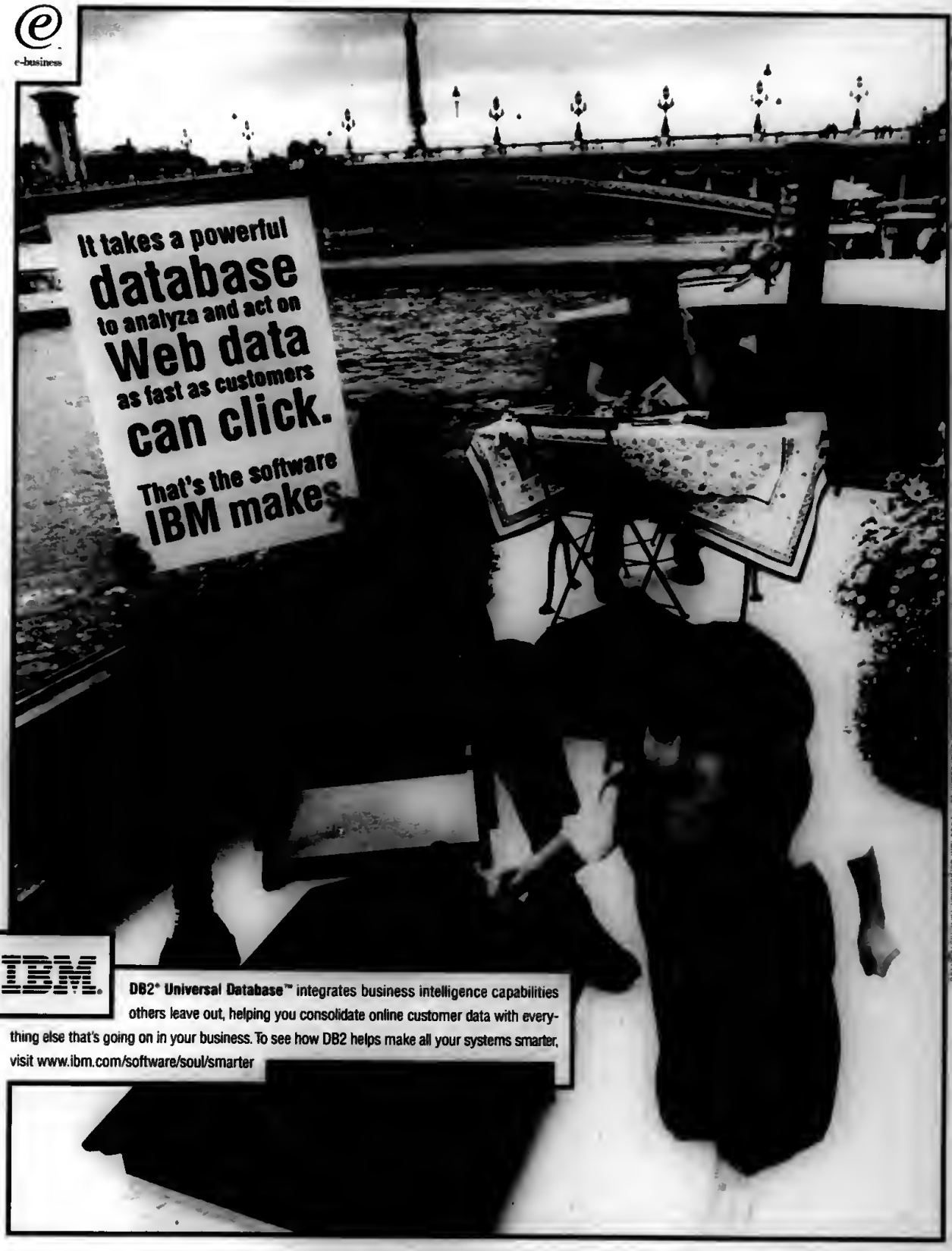
"Session tracking is not very interesting these days because any good commerce platform does a pretty good job on it," says cofounder Jamie O'Neill, the company's chief operations officer. "But session tracking is actually quite hard to do effectively."

By depositing a cookie onto a visitor's PC, the company associates a "clickstream" with that specific customer or registered member. The proprietary system takes the Web logs, compares them to any transactions performed and builds a unique history for each customer. That information is stored in an Oracle Corp. database along with any information the site collects through direct questioning of customers.

Customers who want personalized regional newsletters, "garden minder" tips catering to their spe-

Continued on page 64




e-business
It takes a powerful
database
to analyze and act on
Web data
as fast as customers
can click.
That's the software
IBM makes
IBM
DB2® Universal Database™ integrates business intelligence capabilities others leave out, helping you consolidate online customer data with everything else that's going on in your business. To see how DB2 helps make all your systems smarter, visit www.ibm.com/software/soul/smarter
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Continued from page 62

cial climate considerations or advance notice of weekly promotions get e-mail. Garden.com uses Digital Impact Inc. to manage the mail process.

But Garden.com also wanted to deliver customized content via its Web site, so it extended its NetGravity Inc. ad server to deliver content as well as banner ads. Whenever a customer hits the site, the cookie identifies the visitor. A call to the Oracle database checks residence information and purchase history. Then a request goes to the NetGravity ad server to display content specific to the customer's home region.

Realizing it was using only a small part of the data it was collecting, Garden.com needed a sophisticated analysis tool. After some false starts, it turned to an Austin neighbor, Knowledge Discovery One Inc., better known as KD1 (since acquired by Net Perceptions Inc.)

Until then, Garden.com had been doing only basic customer segmentation along regional and product lines. The KD1 system let it do more detailed analysis. KD1's output could be fed into the NetGravity server to deliver Web content to customers or to conduct e-mail promotions.

For instance, Garden.com recently completed an e-mail campaign promoting Princess of Wales roses. Using the KD1 tool, now called Intelligence Channel, the company identified customers who were deemed highly valuable based on the money they spent in the past year and the frequency with which they visited the site. Those targeted customers outpurchased a control group by 33%, O'Neill notes.

Just the Facts

CUSTOMER: Garden.com

APPROACHES USED: Built proprietary e-commerce engine with customer tracking in mind; bought data analysis tools

PRODUCTS USED:
- Intelligence Channel analytics tool from Net Perceptions
- NetGravity Inc. ad server (since acquired by DoubleClick Inc.)
- Digital Impact for delivery of targeted e-mail
- Oracle8i database

To further take advantage of its customer data, Garden.com is building a Net Perceptions data warehouse that will consolidate information from its Oracle transaction system and Web server logs. Garden.com also hopes to conduct more real-time analysis of customer behavior. Those findings could then be combined with the stored data or information from an outside data-collection company to modify the site to spur sales.

Caution on Privacy

But O'Neill promises the company will proceed "with extreme caution" in that "implicit" personalization arena, which involves data that customers don't voluntarily provide.

"We are really concerned about making sure that we provide a more compelling shopping experience but don't breach any kind of privacy issues with our customers," O'Neill says.

No matter how much the technology can do, O'Neill says he still thinks his site needs "really smart people" to decide what data to pull and how to use it. "There is this vision of the system running itself and brilliantly coming up with a personalized site for everyone," he says. But that's not "near term. That's the Holy Grail."

Collectibles.com: BUY

JEWELRY COLLECTORS typically don't give a hoot about autographed baseball cards, and sports nuts probably won't hunt down porcelain dolls and fine cutlery when they're in the mood to shop.

That's why Collectibles.com, the online arm of Nashville-based Shop At Home Inc., decided to invest in BroadVision Inc.'s One-To-One e-commerce applications to deliver targeted, dynamically generated content to customers.

"We were looking for something that would give us a significant amount of functionality out of the box ... something that we could easily integrate with everything else we wanted to do," says Bob Miller, vice president of Internet technology at the retailer.

During a six-week period last fall, with the help of three integration teams, Collectibles.com implemented a new Retail CRM call center system from Retek Inc. in Minneapolis, Oracle Corp.'s financial, inventory and human resources applications as well as the package from Redwood City, Calif.- based BroadVision. The Common Object Request Broker Architecture (CORBA) distributed-object technology helped staffers hook BroadVision to the other systems, and built-in procedures eased the shift of Oracle inventory data to the Web site. But with so much going on, implementation was a challenge.

Time pressure drove Collectibles.com to choose BroadVision's template-driven package over a more flexible development platform, such as Cambridge, Mass.-based Art Technology Group Inc.'s suite of Java application server-based products. "We signed the deal with BroadVision in June and then launched in November, and that's with very fragmented IT resources, since we had so many projects going on," says Miller.

Information technology staffers developed cookies to be dropped onto visitors' PCs the first time they hit the site, so the users could be uniquely identified. As visitors browse, the BroadVision system helps establish content ratings for them. If a person continually looks at coins, for instance, coin content will be given a higher rating than any other content.

Just the Facts

CUSTOMER: Collectibles.com

APPROACH USED: Purchased commerce and personalization package due to time pressure and demands on IT staff

PRODUCTS USED: BroadVision Inc.'s One-To-One e-commerce engine and template-driven personalization system

SmarterKids.com: BUILD

SMARTERKIDS.COM INC.'S raison d'être is personalization. The Needham, Mass.-based company's mission is to recommend products that meet an individual child's learning style and goals.

But SmarterKids.com didn't find any off-the-shelf personalization software that it felt could help its cause. The most prominent of the scant packages available was costly and required use of a proprietary language. So SmarterKids opted for a homegrown approach: building a complex algorithm that matches a child's profile with the products deemed best for his or her needs.

"I think we probably looked at every personalization product out there," says Richard Viard, the company's senior vice president of research and development. "But our site is very unique, and we're better able to tailor our personalization" to fit the company's needs.

Microsoft Corp.'s Site Server, Commerce Edition handles all of SmarterKids' order processing, NetGenesis Corp.'s NetAnalysis helps with log file analysis and Quadstone Inc.'s Transactionhouse and Decisionhouse tools will be added for mining of the company's Microsoft SQL 7 database.

But in-house staffers constructed the core of the personalization engine using Microsoft's Visual InterDev tool. They built Active Server Pages using VBScript, employed SQL Server's stored procedures, threw in Component Object Model objects and Dynamic Link Libraries written in Visual Basic or C++ and resorted to JavaScript when they couldn't solve a problem.

A staff of educators tests and rates the 3,000 products the company sells and assigns attributes to each. For instance, a game product may be labeled a math "practice" tool rather than an instructional aid.

Just the Facts

CUSTOMER: SmarterKids.com

APPROACH USED: Mostly built its own tools

PRODUCTS USED: NetGenesis's NetAnalysis helps with log file analysis; Quadstone's Transactionhouse and Decisionhouse tools will be added to mine a Microsoft SQL 7 database. The staff used Microsoft's Visual InterDev tool to build the core of the personalization engine.

Detailed Information

But to really make the system work, SmarterKids.com relies on information that parents voluntarily supply about the children who'll be matched to those products. Parents are asked to enter their children's name, grade, age, gender, learning style, learning goods and any test results that might help shape their profile.

To help with a child's skill assessment, parents can obtain a

Collectibles.com staffers identify a visitor's level of interest in various product categories. Mere browsing may add a point to the content rating, viewing details might add five and a purchase may tack on 10, Miller says.

"You can segment your visitors in as fine a way as you care to manage," Miller says, noting that a sports enthusiast might be designated a casual collector if he spends a considerable amount of time reading frequently asked questions.



BOB MILLER says Collectibles.com wants still more personalization

The marketing department can step in and use wizards-based BroadVision tools to earmark content, promotions or advertisements for about two dozen categories of visitors that Collectibles.com has designated.

IT staffers are needed to set up templates and make more complicated changes, such as adding a rule for free shipping.

Scalability is a concern sometimes raised about the BroadVision system, but Miller says his site should be in good shape since it took BroadVision's preferred approach, distributing the software over multiple servers (in this case, two Sun Microsystems Inc. E450s).

Collectibles.com runs its CORBA layer on one machine and the BroadVision Interaction Manager on the other. The CORBA layer interfaces with the Web server and passes requests to the interaction manager, which brokers the requests, determining if it can get the data from its own cache or if it needs to make a database call, Miller says.

Implementing BroadVision isn't cheap. The average price for the software is $400,000, and a company typically spends another $400,000 on consulting sources, a BroadVision spokeswoman said. Miller declines to discuss the cost, saying only that his firm spent $15 million on its entire system, including the revamped Web site, call center, Oracle applications and hardware.

So far, officials say they've been pleased with the results. Tim Engle, president of Collectibles.com, says his company collected nearly $760,000 during March, less than five months since its Nov. 12 launch. "We make 38% margin on that $760,000," he notes, adding that the pace was exceeded with one $170,000 day this month. Among visitors to the site, 95% hadn't purchased anything from the company before.

So Collectibles.com plans to forge onward with more personalized content and add more tools to augment its BroadVision system. The company expects to launch an auction on the site by summer's end, and it hopes next year to deliver targeted video on demand through Java applets.

"Right now," Miller says, "we're not doing anywhere near the level of personalization that we're shooting for." ◗

CD-ROM containing tests developed by SmarterKids. The results can be automatically uploaded to the site.

SmarterKids identifies visitors by depositing cookies onto their PCs. The cookies contain identification numbers that create records in the company's database, Viard says. When visitors hit the site, their cookies are recognized. They're greeted with one page if they're registered and welcomed as first-time visitors if they're not.



RICHARD VIARD: "With off-the-shelf tools, you're often locked in to the way they work"

For parents who've set up a MySmarterKids page for each child, a call is made to the database to check stored profile information. A query is then made to the product database, which searches for the best matches in three categories: new products, best book and best toy. The product information is delivered via Active Server Pages. Hitting a button delivers more products in each category via Active Server Pages.

Next Step

In the future, SmarterKids plans to add a new personalization and promotion engine to deliver different sets of product suggestions to different groups of people — such as gift-givers or grandparents — based on their clickstreams, interests or demographics.

Although staffers again considered outside tools, they ultimately decided to build the engine in-house, Viard says, noting that they'll probably write the system in C++.

"With off-the-shelf tools, you're often locked in to the way they work. We found that a lot of these tools require you to rethink how your site is set up" from a technical standpoint, Viard says, adding that products using Java don't really fit with the Microsoft environment SmarterKids established.

More Than We Need

Many personalization packages come with their own databases and log-file analysis tools, both of which SmarterKids already has. "You might need only one-tenth of what [a tool] does," Viard says.

"Granted, there may be products that are good solutions if you started from scratch implementing that product," Viard says. "If you try to fit into those tools, you might have more problems than it's worth."

SmarterKids does plan to add Quadstone's data mining tool to help analyze the mountains of data it's accumulating. But the company has also hired people who understand the nature of their customers and who are skilled at putting that data to good use within the upcoming personalization and promotion engine.

"The best tool in the world still is not going to give you all the answers," Viard says. "You still have to know what you're looking at and what you're looking for." ◗

The Children's Place: OUTSOURCE

THE CHILDREN'S PLACE RETAIL STORES INC. knew it wanted to do one-to-one marketing with its online customers. But the Secaucus, N.J.-based retailer also knew it didn't have the in-house expertise to do it.

So the company sought outside help and found that, yes, even personalization can be outsourced. The Children's Place left it up to Net Perceptions Inc., a software vendor in Eden Prairie, Minn., to set up its collaborative filtering software with whatever partners needed to be involved.

Unlike some high-profile online retailers, The Children's Place outsources everything. Sunnyvale, Calif.-based Pandesic LLC handles the Web infrastructure. Boston-based Zefer Corp. does the Web design. Cambridge, Mass.-based Akamai Technologies Inc. delivers graphics. Minnetonka, Minn.-based Fingerhut Cos. handles fulfillment and customer service. Sunnyvale-based eGain Communications Corp. does the e-mail maintenance.

"We wanted to stay focused on what we do best: children's merchandis[ing] and [serving] our customers," says Debra Brummer, the company's director of e-commerce.

So her company leaves it to the Net Perceptions tool to study its customers' past and present buying behavior, both at its online and brick-and-mortar stores. Based on that buying behavior, a customer is sorted into a buying community filled with other shoppers who have established similar patterns. The more the customer shops, the more likely the tool's algorithms are to produce effective results. Or so the collaborative filtering theory goes.

"The reason why we're excited about collaborative filtering is because [the tool] learns in real time," Brummer says. "The engine gets smarter with every transaction."

Of course, there are skeptics. There's always the possibility, for instance, that a customer making a one-time gift purchase of fishing gear will receive prompts for rods and reels in the future, even if they aren't regular fishers. But Childrensplace.com asks customers if the item is a gift.

Brummer says her company has seen promising results since the site launched last November. When customers reach the virtual checkout counter, they're shown five items they might like to add to their shopping carts. Brummer declined to divulge the results, saying only that the company is "incredibly pleased."

The Children's Place also tried a small, targeted e-mail campaign based on Net Perceptions' recommendations. Hoping for 9% click-through, the company reached 19.1%, with 14.3% of those customers actually purchasing the suggested product. Brummer added that the average order was 114% more than the normal sale, dollar-wise.

"We're very excited," Brummer says. "We can use Net Perceptions' [tool] and get an immediate return on investment." – *Carol Sliwa*

> The reason why we're excited about collaborative filtering is because [the tool] learns in real time.
>
> **DEBRA BRUMMER, DIRECTOR OF E-COMMERCE, THE CHILDREN'S PLACE**

Personalization: CLASH OF THE KILLER Ps

Can online personalization be profitable and privacy-conscious? By Kim S. Nash

FOR NOW, THERE'S an uneasy truce between the Internet's killer Ps — personalization and privacy. Personalization — the ability of e-commerce companies to modify content to match individual customer preferences — has become one of the most critical ways of generating online sales. If the message isn't one-to-one, you're done, the thinking goes.

But holier tban that grail, experts say, is an exquisite balance between using personal data and guarding it.

Though personalization is front and center in many e-commerce business plans, "privacy is an afterthought," says Jnnathan Gaw, an analyst at International Data Corp. in Framingham, Mass.

Information technology managers are eager to use Web technology's data mining capabilities. After all, knowing who your customers are and bow they behave on your site can lead to more thoughtful, targeted marketing and, presumably, a lot more sales.

However, IT staffers and marketing departments often fail to devise careful policies for using data mining results in ways that preserve customer privacy, Gaw says. That's a mistake at a time when industry and Congress are fiercely debating whether and how to legislate privacy.

"IT people have tn start recognizing that you have to think about [personalization and privacy] in the development of the site," he says.

How Do I Look?

Lands' End Inc. is one company that does personalization right, experts say, even when the data being collected couldn't get more personal.

At the *www.landsend.com* site, women can try on clothes virtually, using online models that are created to look like them. Hair color, body size, face shape and other features are put together to form an online paper doll



MARC BELLOW



that users can dress and rotate.

Just 50 of the thousands of garments at Landsend.com are available for virtual tryouts. But that includes bathing suits, which many womeo dislike trying on under the glare of fluorescent lights at department stores.

"We have some very vocal customers" who suggested adding swimwear to the lineup, says Jeremy Hauser, research and analysis specialist at Lands' End in Dodgeville, Wis.

More than 1 million models have been built in the 18 months the feature has beeo up oo the site, Hauser says. By no means do most customers participate: The site received more than 38 million visits in the past fiscal year, 80% of which were from returning customers.

Still, Hauser labels the feature popular. Though he declined to give a timetable, he says he plans to add male models and hundreds more garments.

Lands' End takes pains to make sure customers can control how much and what kind of information they reveal.

If women don't want to type in their exact measurements to create online models, for example, they can choose from a menu of less revealing descriptions. Bust, for example, can be "small-medium" or "larger" and waist can be "well-defined" or "undefined."

But more important, e-commerce experts say, is the fact that Lands' End doesn't reuse that information to personalize other areas of the site.

Upon logging on, for instance, a shopper with a virtual model on file isn't automatically blasted with cross-marketing come-ons about which sale items would look good on her body type.

That kind of unsolicited personalization generates bad karma on at least two fronts: First, it increases customers' privacy concerns, and, second, it decreases customer trust, says P. K. Kannan, who teaches a course in online marketing at the University of Maryland in College Park.

Do it often enough and customers "will drop you," Kannan says.

Take It Personally

Smart personalization, Kannan says, is done gradually and by giving control to the consumer.

Rather than presenting first-time users with long questionnaires to fill in about themselves, he advises asking few, if any, questions at the start.

Instead, offer optional services, such as a personal shopper or tailored e-mail newsletters. Over time, users will have to reveal more and more information about themselves as they shop and sign up for services.

But the key is keeping the customer in charge of his data rather than harvesting click patterns to make assumptions about individual Web visitors.

Indeed, a Federal Trade Commission report last month found that Internet companies largely fail to protect consumers' privacy. One particular fault: not giving customers access to their data.

In a random sampling of Web sites with more than 39,000 different visitors per month, just 20% met the FTC's standards for a fair privacy policy. Many sites failed to meet one key FTC standard: giving customers control of their personal data.

Of the 100 most popular Web sites, fewer than half — 42% — met the FTC's privacy criteria, the agency says.

The FTC declined to reveal which companies failed. But it suggested that Congress ought to write privacy legislation because industry self-regulatioo isn't working.

When personalization works, it becomes the glue that makes a site sticky, compelling users to return again and again.

Yahoo Inc.'s My Yahoo is a good

Personalization Buster

If there's a personalization movement, there's also an effort to thwart it.

Researchers at Xerox Corp.'s Palo Alto Research Center (Parc) have created an algorithm that's designed to keep the behavior of online shoppers hidden from Web site operators.

For example, you visit an online clothing store and search for size and pricing information for shirts. But the electronic footprints you leave behind are masked in a cloud of other digital information, making it difficult for the online retailer to collect and mine specific pieces of data about you.

The concept isn't new: cryptographers have long talked about similar "oblivious-transfer" mechanisms. But the idea has even more relevance today, when commercial Internet sites harvest user clicks by the thousands, says Bernardo Huberman, a research fellow at Xerox Parc in Palo Alto, Calif.

The new algorithm could easily be added to today's Web browsers, Huberman says. Microsoft Corp., which has several joint development deals with Xerox, could, in theory, add the de-personalization algorithm to Internet Explorer, Huberman says.

A Microsoft spokeswoman says no such announcement is imminent. Meanwhile, online retailers can guard against such secretive shoppers by blocking any browser that uses the technology. "But then they would lose customers," Huberman says. "It's a trade-off of economic considerations."

A patent is pending.

– Kim S. Nash

example. Users can create personal pages that track stocks, show local weather, filter news, suggest new Web sites and offer other services.

"Over time, you get more pieces of information and can build hooks so that the consumer sticks with you," Kannan explains. "It's too time-consuming to jump to another site and set up all the same stuff."

Missteps

Other kinds of personalization techniques can backfire.

For example, Dell Computer Corp. last year let users construct a personal Web page to get tailored help in selecting computer products. Users entered details about the brands and models of their PCs and peripherals, then Dell would make recommendations.

But many users weren't diligent about updating their profiles when they changed or added products. Dell, therefore, was often working off old data and consequently, giving some bad advice.

> Over time, you get more pieces of information and can build hooks so that the customer sticks with you.
>
> P. K. KANNAN, UNIVERSITY OF MARYLAND

So Dell redesigned the service last year to provide more generic online computer support instead.

Amazon.com Inc. often tries to lure wayward customers back to its Web site to shop by recommending books and CDs based on the customers' previous buys.

But that approach is often too broad.

For example, if several family members shop from the same PC, Dad might get an e-mail suggesting he come check out the latest 'N Sync CD. But it is actually 14-year-old daughter Brittany who has an obsession for the all-boy band.

Though the software exists to collect granular data on user behavior, the marketing smarts haven't caught up, says Gaw. "I don't think it's gotten so sophisticated yet" (see "Personalization Buster," page 67).

Amazon.com in Seattle didn't respond to four interview requests. Several vendors, working through various nonprofit organizations, are working on standards for buying, selling and trading customer data.

Exchange Standards Compete

Among the leading contenders is an effort by the International Digital Enterprise Alliance. A nonprofit group in Alexandria, Va., the alliance plans to create a set of specifications based on XML, dubbed the Customer Profile Exchange (CPEX). That standard is supposed to help solve integration problems in blending customer data acquired from outside entities with a company's back-end systems for customer relationship management, order fulfillment and billing.

The first CPEX spec is due by the end of this month.

A similar effort, called the Electronic Commerce Modeling Language (ECML), is also in the works.

The ECML Alliance has created a set of uniform field names for common pieces of customer data, such as name, address and various forms of payment. ECML was designed to help online merchants collect electronic data for shipping, billing and payment.

ECML Alliance members include major credit-card companies, such as American Express Co., Discover Financial Services, MasterCard International Inc. and Visa International Inc. IBM, Microsoft Corp. and other technology vendors are also members.

Meanwhile, both IBM and Microsoft, as well as Novell Inc. and other vendors, separately offer their own digital wallets, which let users store personal data on their PCs and decide which online companies can have it.

The standards projects all compete at this point, and no single format has taken root, says Kerem Tomak, an assistant professor of MIS at the University of Texas in Austin.

"It's in flux, as is e-commerce in general," Tomak says.

But trafficking data about online shoppers — legally and in a methodical, businesslike way — may become quite profitable. Tomak tells of a University of Texas assignment where graduate business students must set up and run e-commerce businesses.

"There was a team last year that opened up an experimental storefront and sold customer demographics to other students at other universities," he says. "Interestingly enough, that was one of the most successful projects." ◗

Not a Help

American Airlines sent this apology via e-mail to subscribers to its discount airfare e-mail newsletter. An apology is nice, but clear information is nicer.

	COMMENTS
To: KNASH@COMPUTERWORLD.COM Subject: Special Notice to Our Valued Net SAAver E-mail Subscribers	
Earlier today, we extended an invitation for you to renew your free subscription to the American Airlines Net SAAver e-mail program.	Where's the salutation addressing the "valued" customer?
We apologize that, due to high demand, you may not have been able to access AA.com today for subscription renewal. Since we are unable to meet demand at this time, we request that you renew your subscription at a later date. Please rest assured that your current subscription is valid and will not be canceled without another opportunity to renew.	Incomplete URL means no hot link available for those customers with e-mail packages that can accept them. When? This afternoon? Next month? This leaves it up to the customer to remember to revisit the Web site.
If you were successful in renewing your subscription earlier today, please excuse this notice.	It's unclear whether the customer should wait and watch for another e-mail or, as implied earlier, revisit the Web site.
Thank you and we apologize, The AA.com Web Team	The lack of an actual person's name reinforces that this is impersonal mass-mail.

SOURCE: E-MAIL FROM AMERICAN AIRLINES, FEBRUARY 2000

AMERICAN RESPONDS: The e-mail was intended as a pitch to get interested customers to provide detailed information about themselves by resubscribing to the airlines' electronic newsletter, says Elizabeth Crandall, director of personalized marketing for American's Web site *(www.aa.com)*.

Plus, the airline "wanted to make sure we were not e-mailing people who didn't request it," she adds.

The message could have explained more clearly how and whether to visit the Web site, she acknowledges.

In e-mail correspondence with customers starting later this year, American plans to address customers by name, Crandall says, adding that thanks to the resubscribe process, "we will know lots of things about people we're talking to."

The Way to Do It

EToys tries to coax idle past customers back to its Web site with chatty e-mail.

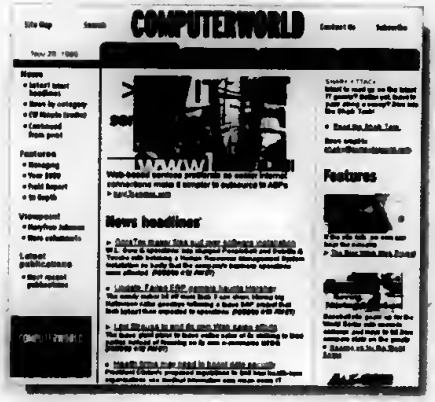
	COMMENTS
To: knash@computerworld.com Subject: eToys Summer Shop and $10 off at GapKids or babyGap	
Dear Kim Nash,	They know her!
Hello, my name is Stacy and I'm a member of the Customer Relations Team at eToys. I noticed that you haven't shopped with us in a while (at least with this e-mail address), and I wanted to take the time to let you know about what's new this season at eToys.	Person-to-person conversation. Good start. Data mining software, not Stacy, probably noticed the shopping pattern, but that's OK. And notice the smart hedge against data mining mistakes in the parenthetical comment.
Throughout the year, we are constantly adding new features to provide you with lots of great products and ideas for kids. To celebrate the beginning of summer, we've put together a huge Summer Shop that's full of all the things that make the coming months a child's favorite time of year.	
And during the month of May, when you spend $50 at eToys we'll give you a $10 gift certificate to use at GapKids or babyGap online or in-store. I hope that you'll visit us soon and that you and your family have a happy and safe summer!	(Two convenient live links were embedded for easy shopping.) Well-targeted coupons, based on the kinds of products the customer previously bought.
Sincerely, Stacy S. Customer Relations Team www.eToys.com Where great ideas come to you.	Stacy S. may not exist (though it behooves an online retailer not to fabricate employees), but it's a nice personal touch.

SOURCE: E-MAIL FROM ETOYS, MAY 2000



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TECHNOLOGY

XHTML UP CLOSE

XHTML is more than a replacement for HTML — this HTML/XML hybrid will pave the way to XML by providing backward compatibility with HTML and legacy browsers. Steven Pemberton, chairman of the World Wide Web Consortium's XHTML Working Group, discusses this emerging standard. ▸75

QUICKSTUDY

XHTML holds the promise of simplifying life for Web developers by clarifying the separation betweeo data, metadata and preseotatioo information. We take an in-depth look at how it works and show examples of XHTML in action. ▸80

GIVE US MORE BANDWIDTH!

The growing demand for Web bandwidth is sparking a flurry of oew tools to manage Web traffic and conteot. Few sites might need such products today, but traffic managemeot will be io-creasingly crucial as Web use grows. ▸78

CANDLE BOOSTS WEB MONITORING

Candle Corp. claims to have the only Web-site monitor that places a Java applet oo the user's PC to track the Web experience from the user's perspective. Now the company is planning a versioo designed to more finely track site performance and resolve some compatibility problems. ▸74

LINUX FOR DEVELOPERS

In a move to spur developmeot of Linux-based applications for the upcoming 64-bit Itanium processors, Hewlett-Packard and Intel are offering Linux developers free Itanium developmeot kits. ▸73

NO MORE WIRES

Wireless computing in a variety of scenarios and using a oumber of technologies was a big part of Microsoft's annual Tech-Ed conference and trade show. Paging, e-mail, Web access and phone-message systems all had vendors and workshop leaders talking about expanding wireless horizons. ▸73

EMERGING COMPANIES

Start-up DecisionPoint Applications says corporate IT can deploy its shrink-wrapped data warehouse products faster than — and at a fractioo of the cost of — custom applications. But can it deliver? ▸86

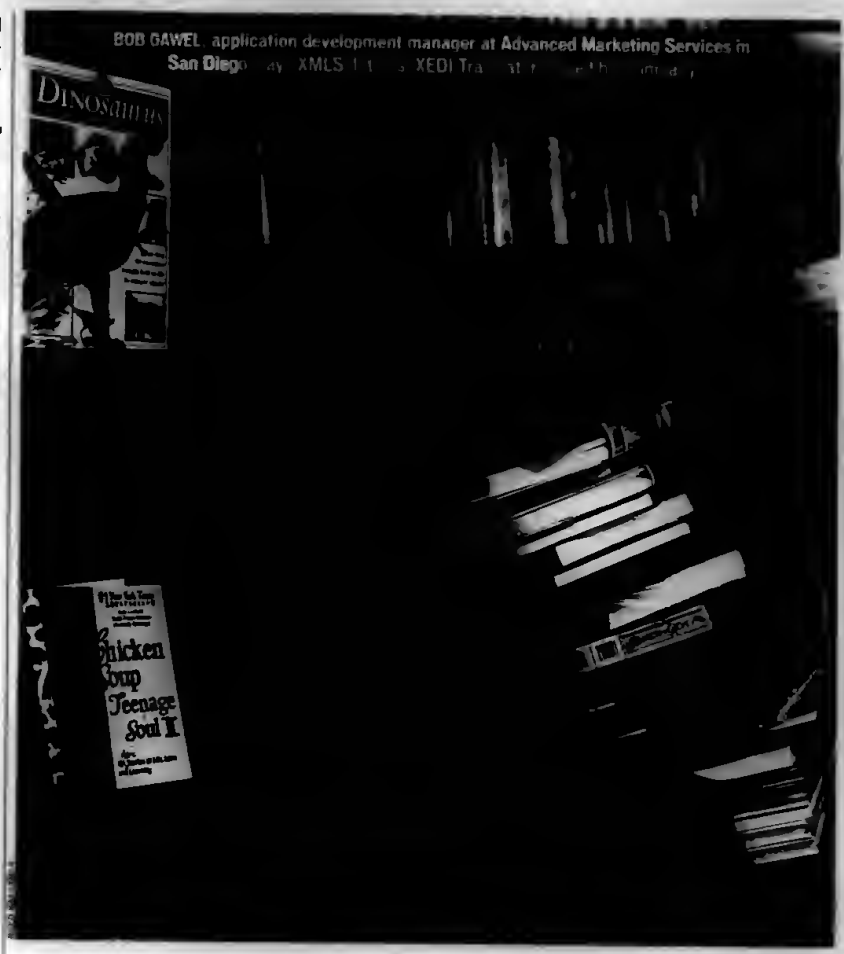
EXEC TECH

Reviewer Barry D. Bayer takes a close-up look at the usefulness and usability of a pair of tiny, handheld, wireless, two-way e-mail devices: Motorola's PageWriter 2000X and a Research In Motioo's Blackberry 950. He also looks at some of the services available for users of such devices. ▸78

FUTURE WATCH

Security is complicated. Quantum physics is more complicated. Scientists at the Department of Energy's Los Alamos National Laboratory and other research groups around the world are harnessing the laws of quantum physics to develop what they hope will be impregnable data encryption systems. ▸82

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Emerging Markets..... 89



PATCHING UP EDI AND XML

ELECTRONIC DATA INTERCHANGE (EDI) IS OLD, EXPENSIVE and complicated, but it's a proven technology to electronically link businesses. XML is the newcomer — full of promise, but still maturing. Until it does, IT managers need a patchwork of tools and services to link legacy EDI-based systems with newer XML-based applications.

84

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Your intern a bigger salary than you.

In today's hot IT job market, "paying your dues" can mean working for less than six figures. And that's not only good for IT newcomers. It's great for you, too. Because right now, your IT experience has never been worth more. Want proof? Register free with ITcareers.com. We have tens of thousands of serious IT opportunities at some of the world's best-paying and best-run companies. When one of our posted positions matches your profile, we'll alert you right away. ITcareers.com is a service of the ITworld.com network, the industry's most trusted resource for all the latest IT news, products, job listings and more. To register, visit www.ITcareers.com.

IT careers.com

IBM to Preload Linux on Some Laptop Computers

Seen as latest step in Big Blue's drive to support the open-source operating system

BY TODD R. WEISS

IBM, DELVING FURTHER into the Linux realm, last week announced that for the first time it will sell some of its popular ThinkPad laptop computers preloaded with the open-source operating system.



"Customers are demanding Linux, and rather than making them wipe off the [standard Windows 98 or 2000] operating system, we're just selling models preloaded with Linux," said spokesman Scott Handy.

The company had earlier begun offering its Netfinity servers with versions of Linux.

The A20m and T20 model ThinkPads will feature Orem, Utah-based Caldera Systems Inc.'s OpenLinux eDesktop 2.4.

The machines will be available beginning in the third quarter, according to Handy. They are expected to be priced similarly to Windows-equipped models.

IBM's worldwide products marketing manager, Tom Follette, said that the company's commitment is justified by customer demand, though he wouldn't give projections as to how many Linux-loaded machines IBM expects to sell.

"We expect this to be something that enough customers will request so that it makes business sense," Follette said.

IBM is evaluating whether to offer other Linux versions, including Red Hat, TurboLinux and SuSE, on some ThinkPads, he said.

In other announcements today at IBM's PartnerWorld for Linux in New York:

- IBM has certified the Linux from German vendor SuSE GmbH for use on several RS/6000 servers, including B50 rack-mountable servers for service providers, 43P Model 150 servers and workstations and F-50 deskside servers for departments and small organizations. Other SuSE Linux applications are expected in the server line later in the year.
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But what sets IBM apart from other companies, according to Claybrook, is that it has been able to change to keep up and even lead in the Linux marketplace. ●

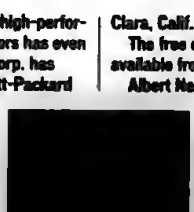
Hewlett-Packard, Intel Offer Linux Kit for Itanium

Before its next line of high-performance IA-64 processors has even hit the streets, Intel Corp. has partnered with Hewlett-Packard Co. to create a free kit to encourage Linux developers to start writing applications for the new generation of chips.

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Wireless Is Talk of Tech-Ed 2000 Conference

Prototypes were among show's highlights

BY RUSSELL KAY

Wireless computing in a variety of scenarios and using a number of technologies was a big part of Microsoft Corp.'s annual Tech-Ed conference and trade show last week. Paging, e-mail, Web access and phone message systems all had vendors and workshop leaders talking about expanding wireless horizons.

Socket Communications Inc. (*www.socketcom.com*) had a number of Bluetooth prototype devices designed to connect handheld personal digital assistants (PDA) or notebook computers with cell phones for what it calls a "two-body" approach to wireless computing. The advantage of this approach is that the small-battery PDA needs to power only the short-range, very low-power Bluetooth connection, while the cell phone, with its larger battery, handles the bulk of the communications load to connect to a wireless carrier.

Socket, in Newark, Calif., already has a cable-connected digital phone card designed for the same purpose, but the cable obviously imposes serious limitations on use. With Bluetooth, the phone can be anywhere within a 30-ft. radius, such as inside a briefcase, backpack or coat pocket.

UltiVerse Technologies Inc. (*www.ultiverse.com*) has created a Wireless Application Protocol (WAP) interface with Microsoft Exchange. The Waltham, Mass.-based company demonstrated the ability to receive voice mail, e-mail and faxes on a WAP-enabled phone at the conference. What was particularly intriguing was the option to reply to e-mail with a voice message — if you've ever tried typing an alphabetic message using a phone keypad, you'll know why this is good news. With the UltiVerse system, Exchange Server records the voice message as a .wav file and sends it as an attachment to an automatically generated e-mail. Integration with Exchange also gives the phone user wireless access to his Exchange/Outlook address book for phone numbers and other information.

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PROXIM demonstrated wireless Internet access using its RangeLAN2 PC cards



Proxim Inc. in Sunnyvale, Calif., (*www.proxim.com*) was in the lending business, too, with its RangeLAN2 PC card for wireless local-area networking. Several areas around the show were set up with RangeLAN2 Access Points to allow wireless Internet access with this card. ●

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ThinkPads With Linux

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Candle Updates, Refines Its Web Site Monitoring Tool

BY ROBERT L. SCHEIER

Candle Corp. is planning a late-July release of an updated version of its Web site monitoring tool, designed to more finely track site performance and resolve some compatibility problems plaguing tbe earlier version.

Candle's EBA Service Monitor, released last year, places a 10KB Java applet on a user's PC to measure such things as how long it takes Web pages to appear in the user's Web browser or how long it takes transactions to be completed.

Release 1.1 of the monitor will include two new features, said Al Duey, director of business development for the EBA solutions group at El Segundo, Calif.-based Candle.

The first new feature, called Browser Instance ID, identifies each session in whicb a customer logs on to a Web site with a unique name. This allows site managers to do a total analysis of tbe paths specific users took through the site but without identifying the user, said Duey.

The feature is attractive to one customer of the current monitor. "It really points out the flaws in the navigation paths" users must take through a site, said William Harvey, services director at AT&T Solutions in Florham Park, N.J., the network management and outsourcing unit of AT&T Corp.

> [The site monitor] really points out the flaws in the navigation paths.
>
> WILLIAM HARVEY, SERVICES DIRECTOR AT&T SOLUTIONS

Insight into End Users

AT&T Solutions uses the monitor, among other products, to measure and improve the performance of the Web services it provides to private customers and application service providers through its AT&T Web Performance Management Service.

"Their technology is unique in the marketplace," said Harvey. "What differentiates the EBA product is the real ability to get beyond the Internet cloud and get insight into the actual end user and tbe end user experience."

The second feature is a new way to tag the Web pages whose performance will be tracked on users' PCs. Currently, the monitor tags every Web page as it is transmitted from the Web server, but it misses some Web pages due to idiosyncrasies in bow different Web sites create the pages, said Duey.

Static Tagging

"Due to the combinations of . . . Web servers used and the techniques the builders of Web sites used to automatically build dynamic HTML, sometimes we weren't able to dynamically tag a page," be said.

The new version will include "selective instrumentation," which will allow a customer to specify which pages they want monitored. It will also allow customers to tag static HTML or the templates used to build HTML pages, as well as dynamic HTML, which is customized for each user.

Pricing for Release 1.1 will start at $2,000 for a starter pack that allows users to track up to 10 Web addresses. A version that allows the tracking of an unlimited number of Web addresses will cost $10,000 per server it's installed on, said a Candle official.

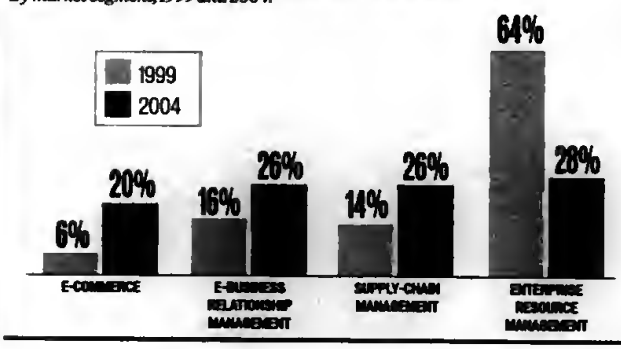
Candle will also sell its Web monitoring capabilities as a service, called CandleNet eBusiness Assurance, with pricing ranging from $2,000 per month and up depending on the volume of data tracked.

As part of the eBusiness Assurance program, Candle will collect and bost data about a customer's site performance and provide access to the data.

SNAPSHOT

Revenue Share for Enterprise Applications

By market segment, 1999 and 2004:



Spreading the Word on XHTML

New standard blends HTML, XML functions

A new standard is promising to smooth the transition from HTML to XML. XHTML is a blending of HTML and XML. The first iteration, XHTML Version 1.0, lets Web sites migrate to XML while allowing their content to remain visible in old browsers (see QuickStudy, page 80).

XHTML redraws the lines blurred by browser makers. HTML is once again meant to be a structural language — tags denote headings and where paragraphs begin and end. Style sheets handle presentation: the placement of items on a page, font and color.



STEVEN PEMBERTON

Senior writer Mathew Schwartz talked with **Steven Pemberton**, *chairman of the World Wide Web Consortium's (W3C) HTML working group, the developer of XHTML, to ask about the latest developments. Pemberton is also a researcher at the National Research Institute for Mathematics and Computer Science in the Netherlands.*

Q: What was the impetus behind creating XHTML?

A: We have *to* see why it was created. Back when Microsoft entered the browser wars, they started creating their own tags in HTML, just as Netscape had been. Now you had diverging HTML languages. To end those battles, the W3C decided *to* create a language where it was perfectly OK to invent tags and thus give the greatest flexibility to people who wanted *to* create Web content. That was XML. With style sheets, [cascading style sheets and Extensible Style Language], you don't need HTML anymore.

Q: Why have HTML or XHTML at all? Why not just go to XML?

A: We had a workshop in San Francisco in May 1998 *to* see if the industry still had a need for HTML. First, even though you have the freedom to use any tag in your pages, people didn't want to have to invent new languages; they were happy *to* stick to standards and not invent their own or maybe just add a little. Second, HTML does have some advantages in that you and search engines know what an HTML tag is — that it is the most important heading on a page — and search engines can do a better job of searching an HTML page because they know what the tags mean. So, people wanted HTML that would partially combine with XML. There's a lot of advantage going to XML, because it makes translations from your database to viewing something on the Web easier, for instance, and it can aid device independence.

Q: Are XHTML 1.0 pages larger than HTML pages?

A: Mostly smaller. We've recoded major sites using style sheets and markup methods, and the sites were smaller. That's because if you do XHTML, the style sheets often only have to be downloaded once for your whole site, and you don't need GIFs to represent text.

Q: Do browser makers intentionally subvert standards?

A: I think it's a learning curve for everyone. I've noticed problems as well — XML gets defined in a certain way, but then how does a reader interpret the definition? There can be confusion; it often takes a few iterations *to* get it right, especially with Java, cascading style sheets and plug-ins. My hope is browser makers don't say, "Sorry, we've already built products around these mistakes, we don't want *to* change it now."

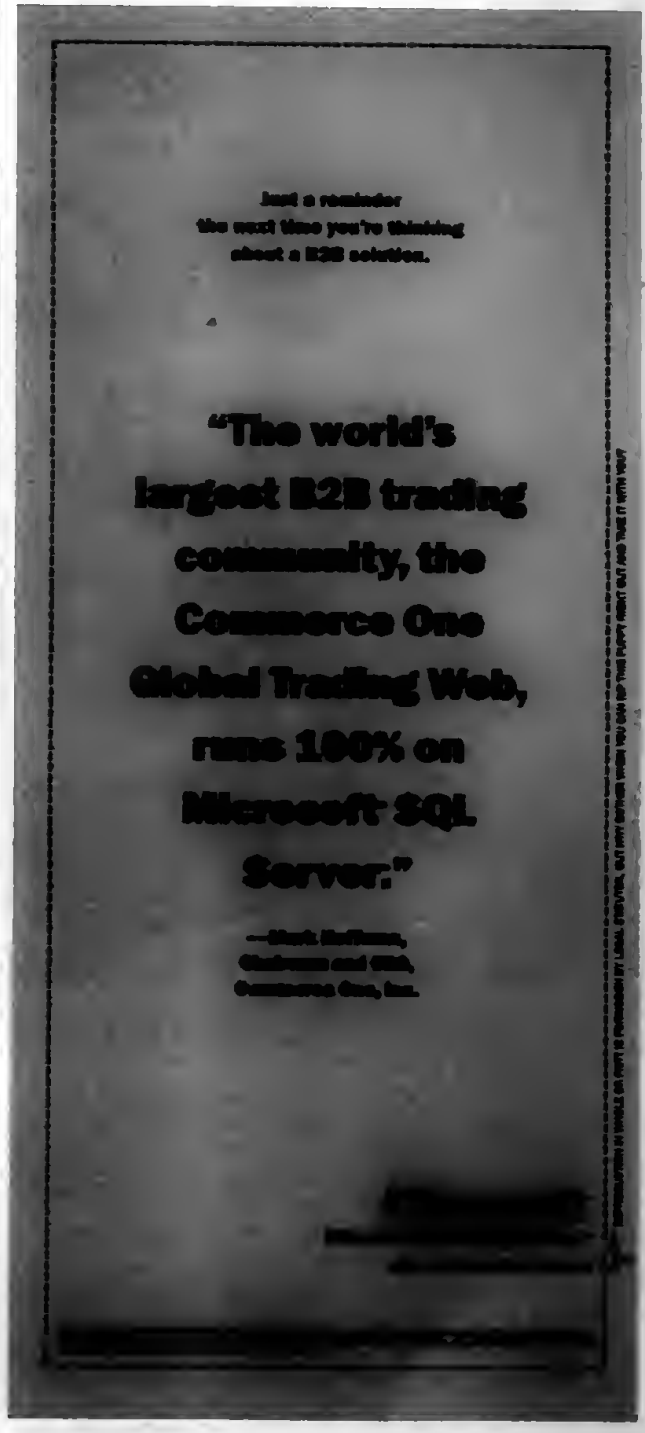
Q: Will XHTML work on older browsers?

A: Some. In the short term, people have *to* do browser sniffing [version detection] if they want to use the fancy stuff in [cascading style sheets]. A lot of sites have to do browser sniffing anyway, because Netscape and Internet Explorer have different implementations of JavaScript. There are work-arounds now, but hopefully they won't be necessary in the future.

BUT CAN IT CHANGE TAPES ON THE MAINFRAME?



For years, robotic delivery devices have followed tracks or wires in floors. Now, Pyxis Corp. in San Diego is offering the HelpMate, which it says can navigate around obstacles without outside help and can even get on and off elevators by itself. Pyxis is pitching the HelpMate to hospitals as a cost-effective way to move drugs, lab specimens, meals and medical records around hospitals. The HelpMate, which can carry up to 200 lb., is being used by at least a half-dozen hospitals, the company said. It declined to disclose the price of the device.



Reuters Launches Services Venture

U.K.-based Reuters Group PLC, a media and information company, and Equant NV in Atlanta, a voice and data network vendor, have launched Radianz, an e-commerce services venture. The companies created Radianz to provide business-to-business Internet services for the financial industry.

The new venture will be based in New York. According to the companies, Radianz will have approximately 500 employees, most of whom will be relocating from Reuters Group, which controls 51% of the venture.

Palm Makes $4M E-Mail Acquisition

Palm Inc., a handheld computer maker in Santa Clara, Calif., has acquired Actual Software Corp. a privately held Andover, Mass.-based company.

The deal means Palm can offer a universal e-mail client to its handheld computer customers by combining Actual's client and conduit technology with Palm's MultiMail products.

The acquisition, expected to close in the fourth quarter, is said to be worth $4 million in cash and stock.

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MobileLogic Rolls Out Wireless Phone

MobileLogic Inc. in New York has introduced Version 2.0 of MobileLogic Phone, a tool that lets wireless phones using the Wireless Application Protocol (WAP) to view e-mail and other corporate data. The update provides compatibility with Microsoft Exchange and Outlook messaging and contact information.

MobileLogic Version 2.0 costs less than $10 per month over a digital PocketNet phone from AT&T Corp. or a compatible handset from Phone.com Inc.

DataCore Introduces SANsymphony

DataCore Software Corp. has rolled out SANsymphony, storage domain server software that lets users pool disparate disk resources and dynamically allocate them among multiple server platforms.

The console software requires Windows NT Server and provides services to Windows NT Server as well as to Solaris, Linux, HP-UX and NetWare servers.

Pricing starts at $7,995 and is based on the size of the storage pool and the number of servers sharing the pool.

EMC, Lucent Strike Storage Deal

EMC Corp. has struck a deal with Lucent Technologies Inc., integrating EMC's storage systems, networks and software as part of Lucent's CyberCarrier initiative. The CyberCarrier initiative offers high-speed, high-bandwidth optical networking and data center capabilities to service providers.

EMC products include Symmetrix enterprise storage systems and software, Celerra enterprise network file server and Connectrix enterprise storage network systems,

IBM, Lotus, Offer Developer Sites

IBM and its Cambridge, Mass.-based subsidiary, Lotus Development Corp., have launched two free Web sites geared toward collaborative application developers. IBM's Collaborative Zone at *www.ibm.com/developerworks* and Lotus' Developer Network at *www.lotus.com/developer* will offer technical articles, new technologies updates, discussion groups and sample code.

Veritas Debuts NetBackup Versions

Veritas Software Corp. will roll out two new versions for its NetBackup software next month.

NetBackup DataCenter 3.4, aimed at large data centers, offers FlashBackup snapshot technology for HP-UX. It also supports online, snapshot backup of Oracle databases and runs on Windows 2000 Server. DataCenter 3.4 will cost $5,000 for Windows NT platforms and $10,000 for Unix platforms.

The NetBackup BusinesServer 3.4, which will service workgroups and remote offices, can restore Microsoft Exchange individual user mailboxes and messages. BusinesServer 3.4 will be available next month for $1,995 for Windows NT and Windows 2000 platforms and $3,995 for Unix platforms.

724 Solutions Licenses WAP Design

724 Solutions Inc. in Toronto has announced that it will license a WAP design for handheld computers from Neomar in San Francisco. The move will enable deployment of secure WAP-based financial services applications on a variety of handhelds. The company will support devices from Research in Motion Ltd., Palm Inc., Handspring Inc. and Microsoft Corp. Products will be available by the end of September.

E-Commerce Propels Network Convergence

The big mover propelling network convergence in no longer voice applications – it's e-commerce, a report released last week said.

"More than 50% of U.S. organizations are planning to make significant changes to their WANs in the next two years to accommodate e-commerce-driven initiatives," said Sage Research Inc. in Natick, Mass. Although only 19% of the 300 surveyed companies offer network access to suppliers, 42% will do so by the end of next year, the report said.

Compaq Launches Storage Utility Service

Compaq Computer Corp. announced its Compaq Storage Utility, a storage management service that lets users pay by the gigabyte for network storage.

Compaq places its disk resources at the customers' sites and manages those resources from its Colorado Springs management center. Storage Networks provides the initial analysis and design as part of the service agreement.

Prices start at $1 per gigabyte per month for the basic service, and a 1.7 terabyte minimum commitment is required.

HOW WILL YOUR IT STAFF SUPPORT THE INCREASING AMOUNT OF ENTERPRISE TECHNOLOGY WITHIN YOUR ORGANIZATION ?



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Vendors Unveil Net Traffic, Content Tools

BY JAIKUMAR VIJAYAN

The growing demand for Internet traffic and content management technologies is sparking a flurry of vendor activity.

Earlier this month, for instance, Edgestreme Systems, a division of Avid Technology Inc. in Tewksbury, Mass., and Seattle-based F5 Networks Inc., announced products that, although not similar, are aimed at giving service providers and corporations better Internet traffic and content management capabilities.

Though few sites need the the high bandwidth offered by such technologies right away, traffic management technologies are crucial for improving Web site performance, said Dwight Gibbs, chief techie geek at The Motley Fool, an online investment site in Arlington, Va.

"The fact that I can set it up and forget all about my bandwidth requirements is awesome," Gibbs said.

Edgestreme's technology, Edgestreme Cluster, lets users optimize delivery of streaming media and other high-bandwidth Internet content.

The product combines a proprietary distributed file system software, shared storage subsystem technologies and content management software to manage traffic between servers containing streaming media. The cluster system can support up to 5G bit/sec. of streaming bandwidth and 5 terabytes of online storage, said Jill Mullen, a director at Edgestreme.

No Tweaking

One of the biggest advantages of the technology is that it allows users to boost streaming media performance without tweaking any of the underlying content, said Pete Mountanos, a vice president of streaming technologies at Streaming Media Inc. in Denver, which specializes in delivering full-motion video.

F5 Networks, meanwhile, is slated to release its new Big-IP content switch, designed to manage large amounts of Internet traffic at high speeds, said Steve Goldman, a vice president at the company.

The F5 Networks switch is one of the first commercial products to be based on the advanced Intel network processor called IXP12000. The user-programmable Intel processor adds more horsepower to F5 Network's existing load-balancing technologies and will provide up to 4G bits of bandwidth, according to the company.

AT A GLANCE

Traffic Cops

Edgestreme Cluster:

- Rack-mounted systems capable of supporting up to 5G bits of streaming bandwidth and up to 5 terabytes of data. Price ranges from $87,000 to more than $1.2M.

F5's Big-IP Content Switch:

- Provides up to 4G bit/sec. total bandwidth. Priced at $4,000 for 100M bits/sec. and $5,500 for 1G bit/sec.

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Although Windows 2000 was introduced just this year, already there are scores of applications that bear the Certified for Windows 2000 emblem. Is there any real meaning for IT behind that certification logo?

In a special supplement next week in *Computerworld*, you'll see that behind that logo is one of the most robust and thorough certification processes ever devised. That process guarantees that certified server applications are optimized to take maximum advantage of the rich features of Windows 2000. Using these applications should enrich the user experience while making life easier and better for the IT staff charged with the responsibility of supporting them.

And server applications Certified for Windows 2000 can actually lower your total cost of ownership, as you'll learn.

Be sure to look for "Are you getting all you should from your server applications?" next week in *Computerworld*.

or go to http://computerworld.com

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E-Mail Anywhere

There's been a lot of hype about wireless e-mail on handheld devices. We check out whether it's worthwhile and how well it works and look at some of the surprising things you can do. By Barry D. Bayer

MY CONSTANT COMPANIONS for the past month have been a Motorola Inc. PageWriter 2000X and a Research In Motion Ltd. Blackberry 950, a pair of tiny, handheld, wireless, two-way e-mail devices. The PageWriter is hooked up to Skytel Communications Inc.'s nationwide Reflex 50 wireless paging system, while the 950 gets its data from GoAmerica Inc.'s repackaging of Atlanta-based BellSouth Corp.'s Mobitex network.

Both units let users receive pages in urban areas throughout the U.S., although paging and fax options with the service from Jackson, Miss.-based Skytel are much more robust than GoAmerica's numeric-only paging. Both systems let users send and receive Internet e-mail, and the Blackberry 950 includes a limited, text-only Web browser (no frames or Java, but 40-bit or 128-bit Secure Sockets Layer encryption works fine).

Powered by a single AA cell, the Blackberry 950 has a 1-by-2.5-cm screen displaying either six or eight lines of 25 to 32 LCD characters each on an unlit screen. The minimalist QWERTY keyboard is augmented by a wheel manipulated by your right thumb: Turn it to scroll text, or click it to select menu choices. A storage holster clips to your belt and protects the otherwise exposed keyboard and screen.

The PageWriter has a clamshell design with a hard case that protects both a backlit 50-key, 5.75-by-9-cm keyboard and 4.25-by-6-cm screen. An infrared serial port connects to a cable through the battery charger cradle. The screen characters are smaller than those on the Blackberry but almost as readable. The PageWriter has 4.5MB of memory — enough for other applications and even some games — and a 68,000-class, 16-bit microprocessor. Instead of a thumbwheel, the PageWriter has a four-position switch that can be pushed to scroll up, down, left or right.

The tiny keyboards and screens of both machines were awkward but usable. Typing with my thumbs became almost automatic after a couple of weeks.

A significant drawback, however, is cost. Monthly service is much too expensive. Hackensack, N.J.-based GoAmerica charges a hefty $60 per month for unlimited paging; e-mail; download of a wide variety of news, sports, financial and entertainment news services; and Web browsing.

Other plans are available from Waterloo, Ontario-based Research In Motion and Princeton, N.J.-based RCN Corp. Skytel charges by the character; monthly bills could exceed hundreds of dollars.

But instant e-mail to and from either device is useful and almost addictive, particularly when others in the workgroup or family are similarly equipped. Wireless Application Protocol-enabled cell phones or Palm VII wireless adaptations are also convenient, but these two-way pagers are lighter and smaller, and their tiny QWERTY keyboards are considerably better than a cell phone's numeric keyboard or Santa Clara, Calif.-based Palm Inc.'s Graffiti character recognition.



PageWriter 2000X
Motorola Inc.
(www.motorola.com)
$399.99

E-Mail on Steroids

Much as I enjoy modern, high-speed Internet access and rich media, I've found that plain old e-mail service (POEMS), with no attachments, hyperlinks or other fancy features can be very useful.

A new service aimed at PageWriter users (for details, visit *www.hz.com*) shows just how handy e-mail can be when you have quick, wireless access. I can send an e-mail message with a command in it and access many different kinds of information quickly:

If I send STOCK IDGB to pi@hz.com, I get a return e-mail with the stock price of IDG Books Worldwide.

FLIGHT AAL 630 gets me the current status of American Airlines Flight 630.

WEATHER 02116 provides a Boston-area weather report.

The principle is simple. Take an Internet e-mail server, add a simple application to parse the message and reformulate it into a database query, then get the answer and send it to the originating e-mail address. Although this service is directed specifically to PageWriter users, it seems to be platform-agnostic and device-independent. [Note: It works just fine from the office PC. — Ed.]

Other Possibilities

This kind of usefulness could be greatly expanded. Consider Web-based appointment books. How difficult would it be to design a POEMS server that could receive the query "App 051000" and respond with the sender's appointments for May 10, 2000?

Then there are the Web-based, thin-client "rent-an-apps." OpenAir.com in Boston, for example, provides credible (if not yet full-featured) Web-based time-and-billing services for a few dollars per month.

No one would want to use POEMS as a full-time interface. But the ability to access public or private databases from a light, handheld device wherever you happen to be is so useful that it just has to happen. If only those wireless service providers could get the monthly cost down. ▶

Blackberry 950
Research In Motion Ltd.
(www.blackberry.net)
$399



Bayer is a practicing attorney in Homewood, Ill., and editor in chief of Law Office Technology Review. *You can reach him at bayer@lawyer.com.*

XHTML

BY MATHEW SCHWARTZ

THE DAYS IN which you could learn HTML in a short time and craft your own Web page using a text editor are numbered. On the bright side, handling any Web site that's bigger than 10 or 20 pages is about to get a lot easier.

"The big win is that you no longer have to force data structures in HTML," says Steven Pemberton, chairman of the World Wide Web Consortium's (W3C) HTML Working Group.

W3C works with businesses and governments to create Web standards. But browser makers historically haven't waited for W3C specifications and have either implemented standards before they're fully defined or implemented them incorrectly. XHTML is the W3C's attempt to redraw lines blurred by browser makers.

HTML was created to be a structural language — nothing more. But browser makers quickly began pushing the envelope, adding presentation capabilities. That often involved nonstandard tags or tricky shortcuts such as using tables to lay out a page, which could slow page-loading times drastically and complicate Web site content management.

In the XHTML specification, the language is once again only structural. Tags are used to mark up headings, paragraphs, lists, hypertext links and other structural parts of the document. Style sheets, on the other hand, handle issues of presentation: fonts, colors and margins. The intent is to simplify sites, decrease download times and more easily present the same content to multiple types of devices.

Easy Does It

XHTML works by separating content from style. Content creators craft HTML; designers create style sheets. This simplifies the Web server's job, since site visitors need to download a style sheet only once. Every subsequent page that refers to that style sheet downloads much more quickly. Changing the look of the site is simplified because you have to change only a few style sheets, not thousands of HTML pages. Web server processing power is saved and less material is transmitted, since HTML documents are free of font tags and color specifications.

A future version of XHTML will introduce modules. Many devices, such as cell phones, would need only a subset of XHTML because modules would automatically filter the XHTML to include only what the device needs.

XHTML will ultimately replace proprietary Web file formats such as Portable Document Format files and Flash and other multimedia formats. For example, the Synchronized Multimedia Integration Language (SMIL Version 1.0, pronounced "smile") allows designers to describe the temporal behavior and layout of a Web page as well as associate hyperlinks with objects. Along with the Scalable Vector Graphics XML standard, designers could create animations or even augment television feeds using XML. ▶

DEFINITION

Extensible Hypertext Markup Language (XHTML) is a transition language that combines HTML and XML. Designed to replace HTML Version 4.0, XHTML is recommended by the World Wide Web Consortium. XHTML Version 1.0, also known as HTML 4.01, is a reformulation of HTML 4.0 as an XML 1.0 application. It includes three Document Type Definitions. Future versions of XHTML will allow modular HTML, which will suit a wide variety of devices, and document profiles, which will ensure interoperability.

Introducing XHTML

As shown below, HTML 4.0 and XHTML can be used to achieve the same result. But when using HTML, the tags used for presentation — how a font looks or where a word is on-screen — must be repeated for every document. If style sheets are used with HTML, then a single style sheet can define the look of an entire site. XHTML goes a step further. By integrating XML, Document Type Definitions (DTD) allow you to create your own tags. Style sheets can then be used to define how every instance of that tag should look in a browser.

TITLE

Document Summary

Document content.

HTML **When using HTML without style sheets, extensive tags that describe how every element is to look must be used.**

```
<font style="sans-serif" color=blue size=4>title</font>
<font style="serif" color=green size=3>Document summary</font>
<font style="monospace" color=black size=3>Document content.</font>
```

XHTML **Using XHTML, all content can be written into the HTML document, the DTD can define what each of the tags means and a style sheet can define how each tag looks. Though XHTML might seem like more work up front, a site with thousands of pages might need only one DTD and a few style sheets. Any time a design change is needed, only those few style sheets would have to be updated.**

XHTML CODE:

```
<head>title</head>
<summary>Document summary</summary>
<body>Document content.</body>
```

STYLE SHEET CODE:

```
head - text-transform: uppercase; font-family: "Verdana", sans-serif; color=blue
summary - color: green; font-weight: bold; font-style: italic; size: 80%
body - color: black; font-family: "Georgia", serif; size: 80%
```

DTD CODE:

```
<!DOCTYPE HYPERLIB [
<!ELEMENT HYPERLIB - - (HEAD, SUMMARY, BODY)>
]>
```

Version Road Map

XHTML 1.0, released in January, is considered the transitional version from HTML 4.0 to XHTML. There are very few differences between it and HTML 4.0. In this release, JavaScript still must be hidden in comment tags. There is some new functionality from XML integration. For instance, developers can use MathML, an XML application for displaying mathematical notation.

XHTML 1.1 is scheduled to be released this month or next month. This version still allows for tables and it introduces modular XML, meaning developers can create their own XML languages or use pieces of already-established XML languages by referring to the Document Type Definition (DTD). DTDs describe what the variables in an XML document refer to, so a browser will know, for instance, that "<Phone Number>" contains a phone number. By using DTDs, companies across industries can agree about how to handle text.

XHTML 2.0 is due next summer. It will include an extensible event mechanism. Current HTML and XHTML can react only to mouse-over or mouse-click events. The new event mechanism will handle events specific to the desktop or devices, such as telephones and Web TV.

With XHTML 2.0, content can be coded once, and browsers on the devices can refer to the DTD to know which portions of the document to exclude and which to include. Then each device can display the content most appropriately. Version 2 will also improve form handling. Much of the information put into forms can be validated on the client side, and users can download multiple page forms, save them in progress, then upload them when done.

XHTML 2.0 will introduce document profiles, which specify the syntax and semantics of a set of documents. By sticking to the profile, which might specify acceptable image formats, levels of scripting and style sheet support, content creators could assure interoperability. A document profile could cover audiences as broad as the users of a certain browser version or as small as a select group of specialists. - *Mathew Schwartz*

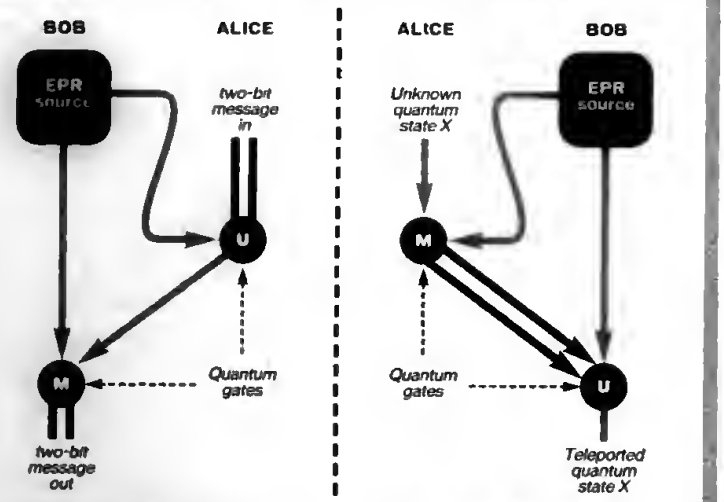
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Basically Uncrackable

New techniques use the laws of quantum physics to develop encryption systems that should be virtually fail-safe against hackers. By Ann Harrison

FIGURE



Quantum entanglement: Bob sends one particle of an entangled pair to Alice, who performs one of four operations on it with the quantum gate M. Alice then returns the particle to Bob, who measures the state of the joint (and still entangled) system with the quantum gate M to receive one of four possible messages (two bits of information), although only one particle (which can exist in only one of two states – that is, carry only one bit of information) has been sent.

Quantum teleportation: Again, Bob sends one particle of an entangled state to Alice, who measures the joint state of this with the unknown state X. She then transmits (classically) this result to Bob. This information can be used to put Bob's remaining particle (the other half of the entangled pair) in the state X.

Note: Quantum communication channels are represented by green lines, classical channels by blue lines.

SCIENTISTS AT the Department of Energy's Los Alamos National Laboratory and other research organizations around the world are harnessing the laws of quantum physics to develop what they hope will be impregnable data encryption systems.

Quantum cryptography systems would allow users to overcome the vulnerabilities of the public-key cryptosystems now widely deployed by businesses and government organizations to secure sensitive information from eavesdroppers.

Public-key cryptosystems use algorithms to encrypt and decrypt data. These cryptosystems send a set of specific parameters — called a key — together with the plain-text information to be scrambled as input into the encrypting algorithm. They generate public keys that senders can use to encrypt a secure message. The receiver then decrypts the message with a private key.

The security of the key relies on a randomly chosen long string of bits. Many public-key cryptosystems use large numbers with more than 100 digits. But such codes can eventually be broken by new algorithms or a powerful computational device that can factor the number into two smaller numbers.

"There is a danger that public-key encryption might be jeopardized," says Paul Kwiat, a researcher at the laboratory in Los Alamos, N.M.

To ensure the long-term security of data, physicists have turned to quantum mechanics to develop cryptography with uncrackable key distribution systems. Quantum cryptography creates and sends code made from a series of individual photons with different polarizations or other properties. The direction in which a photon's electric field vibrates represents the zeros and ones of computer language.

Richard Hughes, another researcher at Los Alamos, has already demonstrated that quantum cryptography can send secure messages through 48 kilometers of optical fibers and one mile of space.

Potential Drawbacks

But Quantum cryptography does have potential drawbacks. Sometimes, the faint pulses used to convey the light particle contain no photons. Or the pulses may contain more than one photon that might, five or 10 years from now, allow an eavesdropper to steal photons from the signal and secretly gather information about the encryption key.

Researchers are working on a new form of quantum cryptography that is based on a phenomenon called quantum entanglement. Entangled quantum cryptography uses a specially prepared crystal to split a single photon into a pair of "entangled" photons. The polarization of each photon then becomes an undetermined state representing a mixture of both zeros and ones.

Even when the entangled light particles are far apart, they influence one another's properties. Each photon could be detected either as a zero or a one, but once the polarization of one photon is detected, the second photon in the pair must assume a polarization that is identical to the first.

The laws of quantum mechanics dictate that a photon's polarization properties can be in a combination of states until it's measured. The photon then gains a definite polarization and can represent a particular value to build a key.

If Alice and Bob attempt to share an encryption key using quantum entanglement, each will receive one photon from a pair. Both then randomly decide to make one of two types of polarization measurements and can communicate which type of measurement they used.

In cases where the same type of measurement isn't used, the results are discarded. However, when Alice and Bob make identical measurements, the entangled photons will produce exactly the same results, which can be translated into bits. This string of digits then serves as the randomly generated information needed to create a secure key for encoding and decoding data.

Scientists believe that quantum entanglement could eventually offer higher transmission rates and greater security over longer distances. According to Kwiat, quantum entanglement might initially be employed by military or special-purpose applications suited to the point-to-point nature of exchanging such keys. He says it could also be used by banks encrypting information to branches or by a provider to encrypt all signals to a satellite. "It is difficult, however, to envision it on a large scale in networking," Kwiat adds.

Recent advances in quantum entanglement were announced in April by three groups: researchers from Los Alamos, a Swiss team and a joint German-Austrian team.

Long-Distance Success

Phil Schewe, a spokesman for the American Institute of Physics in College Park, Md., notes that the Swiss team used quantum entanglement to encrypt a message between two towns via fiber-optic lines. He says the German team encrypted and decrypted an image. Kwiat, who headed the Los Alamos research team, says his group experimented with better ways to detect eavesdroppers, who alter the photon's properties in ways that can be detected via shifts in error rates.

Schewe says the institute has received calls from several firms, including American Express Co. in New York, inquiring about the research. "Even if those photons have moved to opposite sides of the galaxy, quantum correlations do seem to travel faster than the speed of light," he says. "They cannot impart information faster than the speed of light, but they can still communicate with each other instantaneously."



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Until the emerging XML standard matures, IT managers will need a patchwork of tools and services to find their way from EDI to XML and back. By Emily Kay



WHEN ADVANCED MARKETING Services Inc. distributes its books to membership warehouse clubs, the company and its customers exchange purchase order data using electronic data interchange (EDI) technology. But when Advanced Marketing wanted to work online with SamsClub.com, it had to figure out how to send its EDI messages over the Internet using SamsClub's proprietary XML format.

XML is an emerging data-description standard designed to simplify Web-based e-commerce transactions among supply-chain partners. EDI is the de facto legacy standard for automating order processing and document interchange among intracompany or intercompany applications. It enables highly secure document exchanges in a compressed, machine-readable form over private value-added networks (VANs).

To compete in e-commerce, electronic businesses need to support EDI-to-XML interoperability with supply-chain partners. The problem lies in getting EDI and XML data to interoperate seamlessly — and in translating EDI data into the many XML languages. "The biggest challenge is trying to choose an XML standard," says Peter O'Neill, technology vice president at ECOutlook.com, a software and services supplier in Houston. "There is no one XML standard right now."

Despite these challenges, some tools and services are available today to smooth EDI-to-XML integration. But the selection is limited. "The whole XML world is so new, there really are not many tools that support XML, period," says Philip Russom, director of business intelligence at Hurwitz Group Inc. in Framingham, Mass.

EDI to XML: Why Make the Trip?

EDI offers substantial order processing benefits. It eliminates manual operations by facilitating the electronic transfer of information between different organizations' internal applications.

From EDI to X

Its private network transport also guarantees a robust level of security.

But EDI is a difficult technology. It enables machine-to-machine communication, but presents data in such an arcane way that humans can't read it. Only a trained eye can find a purchase order number in an EDI-formatted message, but the same element in an XML document reads *purchase order*.

Adding trading partners under traditional EDI requires customized mapping of each new partner's document format, says Debra Cameron, president of Cameron Consulting in Gaithersburg, Md. In addition, EDI runs oo VANs, which charge $I to $20 for each message. Because VAN bandwidth is expensive, EDI compresses messages. That makes the messages difficult to decipher and debug, which in turn makes it expensive to train and retrain EDI programmers.

Dedicated Servers Required

EDI also requires dedicated servers that cost from $10,000 to $100,000, says Russom. And that's not all. "It's commoo for vendors to spend $250,000 per mooth keeping up the connectioo to the EDI network and keeping the servers up and running," be adds.

Despite such complexities, EDI iso't going away anytime soon. EDI-based transactions over proprietary private networks accounted for "the bulk" of the $500 millioo worth of goods and services that businesses exchanged electronically last year, according to a receot report from The Yankee Group in Boston.

Even with the entrenched investment in EDI, companies haven't adopted the technology widely enough for it to transform the way businesses conduct e-commerce. Operational costs and intricacies have limited EDI's use to about 300,000 companies worldwide — and to about 20% of their suppliers, says Cameron.

Nonetheless, large companies aren't about to scrap their EDI investmeots. "There are a variety of issues that need to be addressed and satisfied before people become comfortable doing this [new] type of [XML] communication," says Kyle Rossler, senior marketing vice president at Williamsburg, Va.-based Huntsman Packaging Corp., an $800 million manufacturer of thin-gauge plastic film used for products such as cereal box liners.

Because it's less complex than EDI, XML is cheaper to operate and support. For one thing, XML messages present data in a human-readable format, so it's easier to train and keep programmers. Companies can also run XML applications on inexpensive Web servers over existing Internet connections, says Russom.

Those reasons, plus the rising popularity of the Internet to facilitate business-to-business e-commerce, have spurred a broad interest in XML.

XML Tools Emerge

Huntsman Packaging wanted to automate its global supply-chain process to let customers use the Web to transmit purchase orders, shipping notices and invoices quickly and easily to the company. But the technological capabilities of Huntsman's thousands of customers are all over the map.

"Many have bomegrown computing systems, others have Oracle, SAP and other ERP systems," says Rossler. Faxed or EDI-transmitted orders from Huntsman's international customers are often difficult to interpret because of language differences and poor telephone connections. A common, automated format will let customers transmit orders from any time zone, obtain immediate order-receipt notification, track order status online and "eliminate the potential for errors and misunderstandings," says Rossler.

Huntsman uses ECOutlook.com's data transformation service to translate customers' order data from any format into EDI for its internal order eotry system. Huntsman's homegrown EDI-based system running on an IBM AS/400 has no compatibility with customers' enterprise resource planning (ERP) systems and other software packages, Rossler notes.

ECOutlook takes data from one company, transforms it into standard digital formats in XML and presents it so that other companies' systems and employees can read it. ECOutlook hosts Huntsman's data transformation application on a Microsoft Corp. SQL Server 7.x database and Microsoft Internet Information Server running on a Windows 2000 Server system at its Houston data center. The application translates data into a commoo XML format viewable by trading partners through Web browsers. It can also integrate data directly into trading partners' back-end or legacy systems.

Advanced Marketing took a different route to EDI-to-XML interoperability. The company turned to XMLSolutions Corp.'s XEDI Translator 1.0 middleware to translate its EDI documents to XML, and vice versa.

The Java-based software, which runs oo Windows NT Server, translates all ANSI X12 and EDIFACT standard EDI messages to XML and maps them to emerging XML standards such as the RosettaNet consortium's RosettaNet Partner Interface Process or Ariba Inc.'s Commerce XML.

Using XEDI, Advanced Marketing can extend its investment in Atlanta-based Harbinger Corp.'s TrustedLink EDI mapping software, which runs on NT Server, without having to change the back-end software. Here's how it works: Inbound XML documents from customers go through XEDI Translator, which decodes them into EDI documents and maps them to a flat text file. From there, homegrown middleware sends the text file to Advanced Marketing's Oracle Corp. I0.7 ERP software running oo a Compaq Computer Corp. VAX AlphaServer. XEDI will also translate Advanced Marketing's EDI data into SamsClub.com's unique XML format.

"We didn't have to plug in another translator and interface with our legacy system," says Bob Gawel, application development manager at Advanced Marketing in San Diego. "We just stuck XEDI in front of our current EDI mapping system [and] we don't have to duplicate a lot of code to deal with XML documents."

Gawel says he considered other products, including Harbinger's e-commerce portal, Harbinger.net, an "on-network" data-transformation service that automatically translates EDI documents to XML. TrustedLink also provides EDI-to-XML data conversion and integration capabilities and in the future will include XML-to-EDI conversion, XML mapping and style sheets for document styling and manipulation, according to Harbinger.

XEDI provided translation support for a wider range of documents, says Gawel. "There are hundreds of different [EDI] documents, and XEDI will translate them all into XML," be adds.

Other Tools and Services

Other tools and services are emerging (see box). Sterling Commerce Inc.'s Gentran:Server, in conjunction with WebMethods Inc.'s WebMethods B2B Integration Server, can handle both XML and traditional EDI, says Cameron. Gentran:Server's XML translation optioo provides "native XML syntax support" in the same way it supports flat files, EDI and databases, the company says.

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- **Sterling Commerce Inc.**, Dublin, Ohio, *www.stercomm.com*
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Start-up Puts Data Warehouse in a Box

DecisionPoint offers applications as a one-size-fits-all solution

BY AMY HELEN JOHNSON

BUILDING A DATA warehouse is on the short list of Potential IT Projects From Hell. It isn't hard to find a colleague with a horror story about a plan that inflated in scope, budget and deadline; or a company that spent millions of dollars on systems that could barely produce an analysis of consolidated raw material costs.

Setting up a data warehouse and a companion business-intelligence system doesn't have to be like that, says Marc Demarest, CEO of DecisionPoint Applications Inc. The implementation principles, data types and most useful reports are the same for certain types of business functions, so why reinvent the wheel?

Portland, Ore.-based DecisionPoint sells a "shrink-wrapped" data warehouse for operational areas like finance, manufacturing, human resources and distribution. Demarest says its products cost hundreds of thousands of dollars instead of the millions for custom solutions — and can be up and running in eight weeks, guaranteed.

That's a big promise that might smack of hubris to shell-shocked survivors of a data warehouse disaster, but Guy Creese, an analyst at Boston-based Aberdeen Group Inc., says several factors favor DecisionPoint's ability to deliver.

There's enough history in the business world to set up best practices, he says. Corporations tend to use the same well-established processes, like generally acceptable accounting practices. Plus, corporations often are willing to trade individuality in their data warehouse setup for a data warehouse that's online. That makes DecisionPoint's short implementation cycle a big selling point, Creese says.

"They are increasing the speed at which companies can start analyzing their business," he explains, "and that's becoming more and more important in today's Internet world." The company has also figured out the right operational areas to target — finance and distribution are major needs in any organization, says Creese.

DecisionPoint's key difference is its completeness, Demarest says. Its integrated, end-to-end applications cover transformation and loading, the warehouse layer, prebuilt schemas and query tools.

Gary Helms, a data warehouse and decision-support manager at Nampa, Idaho-based PC maker Micron Electronics Inc., says his DecisionPoint application extracts data from production, sales, finance and manufacturing databases for analysis of production.

The selling points for Helms were the application's ability to work with Oracle Corp.'s applications and the option of administering the system both on-site and remotely. This means the on-call people can solve any problems from their homes. "The on-call people are able to sleep at night and we have few problems using the extraction tools," he says.

The Next Step

In addition to Oracle software, DecisionPoint works with enterprise resource planning (ERP) packages from SAP AG and Pleasanton, Calif.-based PeopleSoft Inc. Demarest says he wants to expand that list to include business management applications from Denver-based J.D. Edwards & Co. and Minneapolis-based Lawson Software. He says he also wants to further automate the warehouse so that it needs even less administration, increase the number of prebuilt schemas and expand the query and reporting tools.

But his ambitious plans could find a roadblock in customers who are only slowly coming to accept the packaged data warehouse concept. It's a natural evolution of the market, akin to ERP's evolution from custom implementations to out-of-the-box systems, says Creese.

Demarest says he worries that his missionary selling is costing him too much time and money and will slow the company's growth. And he's sweating out the possibility that one of the ERP vendors, which he says have so far been unsuccessful in tackling the decision-support segment of the operational-data life cycle, might build or buy a healthy solution. That would give the ERP competitors a slam-dunk entrée into their existing customer bases, which are DecisionPoint's target market.

Creese also sees another way to deliver DecisionPoint's value proposition — less hassle and fast implementation — further increasing the company's competitiveness. The data warehousing problem is a ripe market for an application service provider, he says. ▶

Johnson is a Computerworld contributing writer based in Seattle. You can reach her at amyhelen@pobox.com.



CEO MARC DEMAREST (left) and founder and CTO Larry Scheurich say they can have a data warehouse running in eight weeks

DecisionPoint Applications Inc.

COMPUTERWORLD emerging companies

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Telephone: (503) 768-3600; (800) 970-5372

Web: *www.dpapplications.com*

Niche: Shrink-wrapped data warehouse software

Why it's worth watching: Its products were designed to lower the cost of business intelligence and provide fast implementation.

Company officers:
- Marc Demarest, CEO;
- Larry Scheurich, founder and chief technology officer

Milestones:
- 1996: Spun off from Sequent Computer Systems Inc.
- January 1998: First product – financials – launched
- July 1999: Human resources and distribution packages released
- November 1999: Manufacturing package released

Number of employees: 60

Burn money: $34 million from Sequent (bought by IBM), Wilmot Capital and private investors

Products/pricing: DecisionPoint for Financials, DecisionPoint for Distribution and DecisionPoint for Manufacturing; pricing starts at $125,000

Customers: Micron PC Inc., Burlington Coat Factory Warehouse Corp., Imation Corp., Aetna Inc.

Red flags for IT:
- You may have to educate your internal customers on the benefits.
- Potential competition from heavyweights like ERP application service providers may squeeze the company.

[the buzz] STATE OF THE MARKET

Data Marts Take Fast Track

Although custom data warehouses are in a different cost ballpark, DecisionPoint can't ignore them as competitors.

At companies that don't lend themselves to a standardized, best-practices type of approach, the build-it-yourself option will always be favored over DecisionPoint's out-of-the-box model.

Even organizations with less complex installations of Oracle, PeopleSoft and SAP software are likely to put a custom application on evaluation spreadsheets.

DecisionPoint's biggest challengers are other players trying to create a shrink-wrapped decision-support market or "data marts."

It's a fast-growing segment of the business-intelligence market, says Dan Vesset, an analyst at International Data Corp. (IDC) in Framingham, Mass.

IDC projects data mart sales to grow from last year's $113 million to $674 million by 2004. Vesset points to the ease of implementation of these packages as the key to their increasing popularity.

ActaWorks

Acta Technology Inc.
Mountain View, Calif.
www.acta.com

Acta is giving its products a modern cyberstore spin, but the underlying technology is purely old hat: Extract data from ERP applications, clean and transform it and put it where it's accessible to employees, partners and customers.

Another piece, Analytic eCache, is a prepackaged business analysis application that competes with DecisionPoint. Acta works with SAP R/3 and PeopleSoft systems.

Noetix

Aris Software Inc.
Bellevue, Wash.
www.noetix.com

Noetix builds data warehouses out of Oracle databases, providing the subject-area schemas, the SQL to build those schemas and the Oracle views needed to populate the warehouse. An extraction, transformation and loading tool is also necessary.

Another core piece of the system, NoetixViews, gives end users query and reporting features as well as a Web Query package that gives end users the ability to make those queries via a browser. A cross-operations extension to the NoetixViews product allows data to be combined from multiple operational units.

– Amy Helen Johnson

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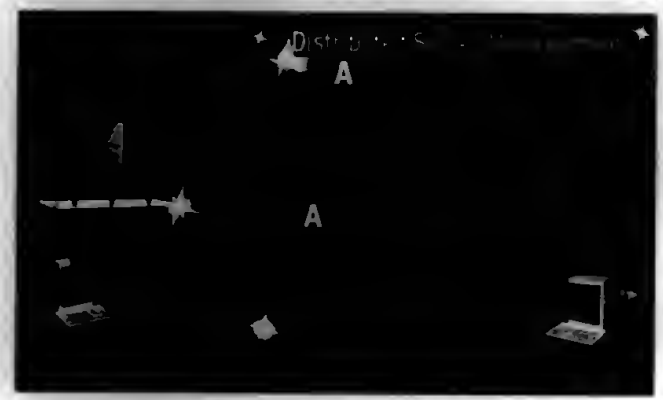
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Growing Pains

BY ERIK SHERMAN

PEOPLE USUALLY GO where the jobs are, and a fast-growing city would seem to guarantee large-scale employment for information technology professionals. Right?

Not necessarily. Reality is often deceiving when it comes to the job market in a rapidly expanding city. Consider Naples, Fla., No. 5 on the U.S. Census Bureau's list of fastest-growing metropolitan areas. No hotbed of high-tech and corporate employers, Naples is largely a retirement and resort community.

So if you're an IT professional and have an urge to relocate, here are some fast-growing areas in different parts of the country that may present some surprises.

Las Vegas

Logic would suggest that Las Vegas is the capital of the gamble, and it is — in the casinos. High tech, on the other hand, is becoming a sure bet.

The Nevada Development Authority estimates that more than half of the nongaming jobs added to the region last year were IT-related. Long-standing efforts to woo new businesses and expand existing corporate presences have finally paid off.

"It's just in the last five years that we're attracting the sophisticated, high-paying companies," says Somer Hollingsworth, president of the Nevada Development Authority.

Ford Motor Credit Co. opened a 700-person regional office in the area, and Providian Financial Corp. built a 65,000-sq.-ft. campus for 800 people. Many of the new sites are involved in manufacturing, distribution and call center operations. Business expansion means that many IT workers have to be brought in from other areas.

Once you're here, outdoor activities are popular, with a lake, rock climbing and skiing nearby. The average price of a 2,000-sq.-ft. home is $136,000. Housing costs are held in check by new construction to accommodate the population influx and the fact that traffic is relatively light, making most locations equally convenient.

"You can live in almost any part of the valley and get to any other part in 20 to 30 minutes, including [during] rush hour," says Hollingsworth.

Growth does cause some stress, though, especially on the school system. Hollingsworth says the region must build a new grade school every 30 days to keep pace with a student population that has reached 225,000. And expect to invest some of your economic growth in an air conditioner for scorching days and sweaters for cool nights.

Austin, Texas

Austin is a place where the haves really have, as average household income has soared ahead of the median. Last year, the area boasted an average income of $70,782 and a median income of $42,370. And those coming from major cities will find the relatively low cost of living a pleasant surprise. There is no state income tax, and other costs are low.

"It offers a lifestyle upgrade you might not have had if you didn't make the move," says John L. Heithaus, senior vice president of operations at Beaverton, Ore.-based Virtual-Relocation.com. That might be why the greater Austin population jumped from just over 259,000 in 1990 to more than 1.1 million in 1998.

With all this growth, of course, nothing is cheap: Housing prices are escalating, although new construction helps moderate the trend, and costs are still less in the city proper than in the suburbs.

Austin has been pushing for companies to relocate their headquarters to the area, with Exxon Mobil Corp. being the latest catch. "Dellionaires," who made their fortunes at the PC manufacturer that calls Austin home, are responsible for many start-ups. As a result, unemployment is around 2%.

Wilmington, N.C.

Sitting on the Cape Fear coast, with cultural amenities and natural beauty, it's easy to see why Wilmington is the ninth fastest-growing metropolitan area in the country — and why companies have happily moved there. Locals are apt to say that people are paid one-third in sunshine. It's often meant literally. IT salaries in the region are sometimes only two-thirds of what similar positions pay elsewhere.

"Someone who would have director responsibilities in a small company with growth potential, we're talking about $45,000," says Alice Mitchell, personnel specialist at Senc Technical Services Inc., a local IT recruiter. "It's always a shock when people first are grappling with what the area pay rates are."

In short, companies are used to paying less and want to continue the tradition. Retirees who want to stay active but don't view a salary as their only income are one reason. Another is that many of the businesses in the area are lower-paying service firms.

The cost of living is 102.6% of the national average, and housing is almost 12% more expensive than average. Those thinking about commuting to Research Triangle Park, a hot employment area, should reconsider, because it's a two-hour drive in one direction. ▶

Sherman is a freelance writer in Marshfield, Mass.

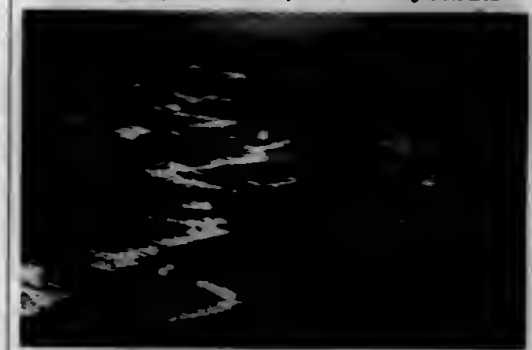
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IT GROWTH in Las Vegas makes the job market a sure bet



AUSTIN, TEXAS, hopes to entice companies into moving to the area



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- In **Technology Development**, we are seeking experienced technical architects and engineers to lead and provide infrastructure design and implementation services for technology projects. Openings exist in several areas, including Networking (ATM and Gigabit Ethernet), Oracle DBMS, UNIX (HP-UX and Solaris), NT, Windows, Netware, TCP/IP, centralized storage and Internet technologies (Web servers, firewalls, etc.). Specific immediate needs include an experienced (five or more years) Network Architect/Engineer, familiar with IP Routing, OSPF and layer-3 routing switches, to assist in our migratioo to a multi-gigabit network backbone, and a UNIX architect/engineer experienced in server design, specification and implementation. Requirements in these areas include a BS or BA degree in Computer Science, or related field.

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IT Careers in PeopleSoft

For the past decade, businesses have been reinventing the way they support their primary effort. Much of that reinvention has been based on PeopleSoft software applications that support finance, payroll, treasury, human resources and benefits

After developing the solutions for the most powerful companies in the world economy, PeopleSoft developed Select, a cast of applications suitable for mid-sized businesses. And now, the company is reinventing itself, offering web-enabled applications and application host providing through PeopleSoft eCenter.

Along the way, PeopleSoft forged the power of alliances and partnerships, forming a tight group of partners who are the first to know of new developments and who help companies implement and mine the power of their PeopleSoft applications

The result is that PeopleSoft is emerging out of the back office to provide an integrated information technology that links internal business processes to serving the customer. Career opportunities abound with PeopleSoft, but also with that network of partners and alliances who are expert in making the applications work for customers.

DigiTerra, Inc.
Denver, CO

Almost two decades ago Business Information Technology (BIT) was founded as a human resources consulting services provider. BIT grew to support the full line of PeopleSoft applications, including financials, student administration and manufacturing, in addition to human resources. When PeopleSoft applications came on the scene, the company was one of the first to help companies redesign their back-office processes and implement the software.

BIT was acquired in 1995 by Ciber to become the company's PeopleSoft ERP practice. Then in April of this year, Ciber announced the formation of DigiTerra, Inc., an e-business enterprise application integration business, which is a spinoff from Ciber. The goal is that by Fall 2000 DigiTerra will be a new publicly traded company.

"It has meant a change in the business model over the years," says Garth Carter, vice president of sales for the central region. "Our business is about enabling e-business, and PeopleSoft's Version 8.0 is fully web-enabled. The changes in our consulting services reflect the changes in technology and that PeopleSoft is taking with its product line. Version 8.0 will be fully web-enabled, enabling an e-business, and that is what we are all about."

DigiTerra offers customers complete end-to-end e-business solutions, beginning with development of e-strategies through customer service, gaining efficiencies and creating the e-business front-end and back-office integration. "We work to establish a solid business foundation that will support the e-business strategy," Carter explains. "The key is in accessing the back-office systems from the front-end. Our clients want to allow their customers the capability to check an order status or payment status via their web site. This requires integration to their back-office systems." The company provides this end-to-end approach to a variety of clients, ranging from Johnson Controls to Northwestern University and the School of the Art Institute of Chicago, to Sun Trust Bank of Atlanta and Honda of America Manufacturing.

To provide these services, DigiTerra hires employees in three categories: project management and large-scale implementation; 2) functional expertise – people who have been practitioners in the areas of business touched by PeopleSoft applications; and 3) the highly technical expert with skills in PeopleSoft, Internet development and integration, tool development, Java, XML and Visual Basic. Generally, employees work on projects for six months to a year before moving to a new challenge.

"As part of running our business, we reinvest in the careers of our 1,100 professionals," Carter says. "Everyone begins with an orientation program on how we do business, the methodology and approaches we use, as well as an introduction to our clients and their expectations. But after you've been with us a while, we want to make sure you know the newest releases, the newest technologies. Because we are a Certified PeopleSoft Partner, we are among the first to gain knowledge about new releases and products."

Despite the pre-IPO status of the company, DigiTerra offers stability and a proven track record for success. "We are very established in the PeopleSoft marketplace, and our clients are our strongest endorsement," adds Carter. DigiTerra offers opportunities across the United States and Canada.

PPL, Inc.
Allentown, PA

As one of the Northeast's largest utility companies, PPL offers a wide range of career opportunities for IT professionals. Most every system and operation relies on IT to process, deliver, monitor and serve customers.

Joe Schulte, manager of the information solutions – services group at PPL, says those working with PPL in IT can choose areas – customer service where web-based applications are being developed and a client/server environment maintains systems; power delivery/wholesale energy marketing, which operates as a trading floor for wholesale energy and involves IT support of traders buying and selling on the open market; power production, which includes operational support systems at energy production sites, including the recent development of a new client/server/web work management system for a nuclear power facility, and back-office operations, which include PeopleSoft applications supporting finance and personnel and web-based systems in legal and corporate affairs.

"The back-office capabilities of PeopleSoft are the basic blocking and tackling of this business," says Schulter. "We went to PeopleSoft in 1995 and 1996 and have been adding new modules and enhancements ever since. In the last two years, we completed installation of general ledger, project costing and employee expense. We're now implementing three additional modules in treasury and will be introducing the time/labor modules later this year."

However, Schulter believes the most intriguing aspect of PPL's use of PeopleSoft is that the company is currently updating its technology plan. "We are evaluating and looking very hard at additional developments to support the business," he says. "These range from decision support and data warehousing to budgeting." In addition, Schulter and his group are examining how to better integrate PPL's compensation planning process with PeopleSoft's modules.

Currently PPL has approximately 400 employees in the Information Services Division, with approximately 130 of these individuals working in application development and support. "The best applicant for PPL is someone with a good technical background, two years of PeopleSoft implementation or support with UNIX or Oracle platforms is ideal," says Schulter. "We need people who take personal responsibility, who meet commitments and are flexible."

The traditional IT career at PPL is one of increasing responsibility. "We encourage people to move into other areas, whether solutions development, operations, or the actual development of our technology design and computer infrastructure," Schulter adds. "We provide a liberal amount of monetary support for technical skill training, but also for interpersonal skills training, both on-site and off-site. The biggest motivator, though, is the challenge of our work."

Schulter says PPL offers a friendly, informal and helpful environment. "We have worked with employees to find ways to improve what is offered at PPL, including increasing the number of salary comparisons we do, offering flex time and telecommuting, and providing awards that support performance," he adds. "We've doubled our development staff in the past couple of years, but have been able to keep retention up around 93 percent."

reSOURCE PARTNER, Inc.
An Interliant Company
Columbus, OH

A leading ASP (application service provider) offering top tier applications and solutions over the Internet is reSOURCE PARTNER, an Interliant company based in Columbus, OH. Sam Amore, vice president-marketing, ASP Solutions, says the company's role is to provide more than just hosting solutions to mid-market companies.

reSOURCE PARTNER implements, hosts and supports businesses using the PeopleSoft application, as well as many other complementary applications. One of the applications that reSOURCE PARTNER offers is the PeopleSoft suite of ERP software.

"An important differentiator for reSOURCE PARTNER is that we can integrate PeopleSoft modules with other applications, providing an end-to-end solution for our customers," he says. "We offer a broad array of leading applications that fully empowers the customer by letting us handle the IT infrastructure, and letting them focus on their core business."

reSOURCE PARTNER caters to predominantly mid-market companies from a diverse range of industries. The company seeks employees with human resources and financial implementation experience with large companies or individuals who have implemented and utilized the application in a functional position. "The strong functional experience is key," says Amore. "We need people who know not only the application but the business process side as well. People who are flexible, and who have a desire to work in an up and coming industry will do well in our organization."

reSOURCE PARTNER offers a diversity of projects and work within its business model. "You get broad exposure to several business issues that span application integration and application hosting. We're a leader in the application service provider space. There's no place better than to be working for a leader in an emerging industry," says Amore.

Advertising Supplement

IT Careers in PeopleSoft

For the past decade, businesses have been reinventing the way they do their primary work: much of that reinvention has been based on [illegible] applications that support finance, payroll, treasury, human resources [illegible].

After developing the solutions for the most powerful [illegible] in the world, PeopleSoft developed Select, a set of applications suitable for mid-sized businesses. And now, the company is reinventing itself, offering web-enabled applications and application host providing through PeopleSoft eCenter.

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BIT was acquired in 1998 by Ciber to harness the company's PeopleSoft ERP practice. Then in April of this year, Ciber announced the formation of DigiTerra, Inc., [illegible] enterprise application integration business, which is a spin-off from Ciber. The goal is that by Fall 2000 DigiTerra will be a new publicly traded company.

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PPL

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PPL Corporation
Allentown, PA

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Currently PPL [illegible] information [illegible] individuals [illegible] "The [illegible] back-[illegible], two [illegible] support with [illegible]. "We [illegible] consulting [illegible]."

The [illegible] IT [illegible] at PPL is one of increasing [illegible] people to move into other areas, [illegible], operations, or the actual [illegible] design and computer [illegible] infrastructure," Schuller [illegible]. "We [illegible] off-site. The biggest [illegible] though, is the challenge of our work."

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Unix Software Engineer wanted by Co involved in automated securities trade execution & analysis in Culver City, CA. Must have Bach or equiv in Comp Sci or related field & 1 yr exp in prgmg & dvlpg s/ware using object-oriented analysis & dsgn in C/C++ & Perl languages on UNIX. Respond to: Stephanie Bevan, HR Rep, ITG Inc., 400 Corporate Pointe, Ste 655, Culver City, CA 90230

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Systems Engineer sought by S/ware Dvlpmt Co in Kirkland, WA. Must have MS in Comp Sci & 3 yrs exp preparing detailed specs for writing, dsgng, coding, testing, debugging & documenting prgms using MS Access, VB, VBA & SQL Server Manufacturing/ERP background preferred.

Respond to: HR Dept, Intuitive Manufacturing Systems, Inc., Attn: Sara Gillam, 12131 113th Ave. NE, Ste 200, Kirkland, WA 98034.

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Member of Tech. Staff – Network Architecture Group (Telecommunications Engineer) Duties: Responsible for continuous improvement of company's hybrid fiber coaxial and digital transmission networks and components including amplifiers, filters, analog/digital modulators, and passives. Includes identifications to the company's target network architecture as well as evaluation of new radio frequency and optical technologies and components being deployed in that network. Lead efforts on evaluating various alternative digital telephony products through a rigorous testing regimen, documenting test results, and working with suppliers to resolve any shortcomings. Take part in the cost-benefit evaluation of core cable television networks and components, including the SONET network. Use spectrum and network analyzers to perform radio frequency component testing in the company broadband laboratory. Requires: a B.S. Telecommunications, Electrical Engineering or related field, plus working knowledge and/or coursework in the following: 1. Digital transmission networks including telephony systems and SONET. 2. Radio frequency components, measurements and transmission systems including filters, amplifiers, spectrum analysers, test instruments, network analysers and analog/digital modulation schemes. 3. Optical technologies and components. 4. Project management and basic cost-benefit analysis. Location: Westminster, CO. Working Conditions: M-F 8 a.m. to 5 p.m. Salary: $66,500/yr. Reply by resume only to Colorado Department of Labor & Employment, Employment Programs, Attn: Jim Shimada, Tower 2, Suite 400, 1515 Arapahoe Street, Denver, CO 80202-2117 and refer to job order number: CO 4662308

Software Consultants-40/hr wk M-F 8a-5p $61,443/year. Develop, test, and maintain software. Prepare program specifications and test system integration. Analyze and supervise programming activities. Analyze user requirements, procedures and problems to automate processing and improve existing computer systems. Define system scope and objectives and write a detailed description of user needs, program functions and steps required to develop computer programs. Consult with users to identify current operating procedures and clarify program objectives as well as submit plans to user for approval. Work with MS-DOS, COBOL, CICS, DB2, XPEDITER and FILE-AID. Several positions available. Req'd Bachelor degree or foreign equivalent in Computer Science, Engineering or related. Application by resume only. Work located in Colorado Springs, CO. Mail resume to Colorado Department of Labor and Employment, Employment Programs, ATTN: Jim Shimada, Two Park Central, Suite 400, 1515 Arapahoe Street, Denver, CO 80202-2117 and refer to Job Order No. CO4662695.

Technical Lead sought by computer software consulting company in Greenwood Village, CO, to work in Phoenix, AZ & other unanticipated job sites in the U.S., to design & develop cross-platform software applications that incorporate client/server, mainframe, &/or networking architecture. Use Visual Basic, C, C++, Java, HTML &/or COBOL programming in the design & development process. Design applications which incorporate DB-DC, DB2, Oracle &/or SQL server database & use OMF tools to read & update these databases. Code, test, & debug the software applications & provide user training & support. Requires Bachelor's, or foreign degree equivalent, in Computer Science or related field (including Electronic Engineering), 2 yrs experience designing & developing software applications. Working knowledge of DB-DC databases & OMF programming tools. $70,000/yr. M-F 8am-5pm. (3 openings) Respond by resume to James Shimada, CO Department of Labor & Employment, Tower II, #400, 1515 Arapahoe St., Denver, CO 80202, & refer to Job Order No. CO4662934.

Technical Analyst (User Support) [multiple openings] Using advanced technical and business skills, investigate and resolve customer problems with computer software, specifically Internet-based business software. Receive telephone calls from customers having problems with RDBMS, ERP applications and Internet-based business software. Participate in diagnostic procedures. Identify and develop application enhancements including introduction of new functionalities and technologies. Develop workarounds to technical and functional problems, and suggest technical resolutions. Reqs: Positions require MS in CS, Business, Finance, Accounting or related field. Educational or experience background must include 1) RDBMS, 2) enterprise resource planning (ERP) applications, and 3) financial or accounting applications. Job site/interview: Colorado Springs, CO. $58,010/yr. 40 hrs/wk. Application by resume only. Send resume to job order number CO4662348, CO Dept of Labor & Employment, Employment Programs, ATTN: Jim Shimada, Two Park Central, Suite 400, 1515 Arapahoe St, Denver, CO 80202-2117. EOE.

Software Engineer sought by computer software consulting company in Colorado Springs, CO, to work in Mountain View, CA & other unanticipated job sites in the U.S., to design & develop client/server & web-based software applications that interface with Oracle relational database management systems & run on a variety of platforms. Analyze requirements. Create designs & design documentation. Code, test, & debug the software applications. Use C++, Pro*C, PL/SQL, SQL Developer 2000 & Designer 2000 in the development process. Requires 4 yrs experience designing & developing client/server software applications that interface with Oracle relational database management systems. Working knowledge of Pro*C, C++, & PL/SQL. $70,000/yr. M-F 8am-5pm. (2 openings) Resume by resume to James Shimada, CO Department of Labor & Employment, Tower II, # 400, 1515 Arapahoe St., Denver, CO 80202, & refer to Job Order No. CO4662699.

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Computer Programmer/Analyst wanted by Information Systems Co in Toledo, OH. Requirements: MS Fox Pro 6.0, Mere Mortals Framework for Fox Pro, MS Visual Basic, MS VB Script, HTML & Data Transfer Protocols (FTP, TCP/IP, MAPI), 2 yrs in design & dvlpt data delivery applics, internet/intranet applics, MS SQL, Multi-tier architecture, BS degree in Computer or Mathematics. Respond to: HR Dept, Innovative Systems Development, Inc., 3361 Executive Pkwy, Toledo, OH 43606-1377.

Programmer/Analyst needed. Analyze design, develop and test. Maintain document and implement business accounting transportation information systems. Review and update programs to increase efficiency. Work with Oracle, RDBMS, Powerbuilder and Windows NT. Must be willing to travel and relocate as required. Several positions available. A Bachelors degree or equivalent in Computer Science or Engineering or related field and 2 years experience in the job offered or in a related occupation as a Computer Professional required. 40 Hrs./Wk, 8:00 a.m. to 5:00 p.m. $42,000 per year. Must have proof of legal authority to work in the United States. Send two copies of your resume to the Iowa Workforce Center, 215 Keo Way, Desmoines, Iowa 50309-1727. Please refer to Job order IA1101066. Employer paid advertisement.

Programmer wanted by Software Development Co in Sugar Land, TX. Must have Bach in Comp Sci or MIS & 6 mos exp in object-oriented prgmg, database design & EDI.

Respond to: HR Dept. (YL), ABB Network Management, Inc., 1601 Industrial Blvd, Sugar Land, TX 77478.

Focus Technologies LLC is a Dallas based software company specializing in distributed computing and E-Commerce technologies. We are looking for talented IT professionals skilled in CORBA, JAVA, EJB, C++ and MTS. The ideal candidate will possess a masters in computer engineering/computer science + 3 years experience or bachelors degree in computer engineering/computer science and 5 years experience. Interested applicants should send resume to: jobs@focus-technologies.com

Software Engineer wanted by Dvlpt Co in Sugar Land, TX. Must have MS in Comp Sci & 3 mos exp in numerical modeling, object-oriented programming & database design.

Respond to: HR Dept (WHL), ABB Network Management, Inc., 1601 Industrial Blvd, Sugar Land, TX 77478.

Software Engineer wanted by Comp Hardware/Software Sales & Services Co in Houston, TX. Must have BS in Comp Sci & 6 mos Object-Oriented prgmg & networking exp.

Respond to: HR Dept. Computize, Inc., 1008 Wirt Rd, Ste 140, Houston, TX 77055.

Software Engineer wanted by Co providing network mgmt applics & auditing security in Houston, TX. Must have Bach in Comp Sci.

Respond to: James King, HR Dept, Network Information Systems, Inc., 1700 West Loop South, Ste 1100, Houston, TX 77027. Put Job Code PT1904 on resume.



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Programmer Analyst (Legacy Systems-VAX computers): Structured systems analysis, design, devlpm't, testing, implementation & integration of complex on-line transaction processing distribution, mtng & other MIS application systems to a multi-hardware/multi-software environ. Incld'g VAX cluster & VAX workstations using file systems, relational/network database mgmt systems, Third Generation Language (3GLs), Fourth Generation Langauges (4GLs), forms packages & GUI front end tools. Design & devlpm't of mission critical client-server systems & migration of legacy systems to client-server architecture. Req: B.S. sci./comp. sci./engr g/math/business-commerce (or equiv.) & 1 yr exp to job offered or as programmer/systems analyst. Must have appropriate combination of skills as follows: 1 of A & 3 of B or 2 of A & 2 of B as follows: A) DBMS: Rdb, Oracle, Sybase; B) tools/languages: DECforms, DECdesign, CODA, ACMS, C, DECwindows, Pathworks, PowerHouse, X-Windows/Motif, Digital Unix, RMS. High mobility preferred. (multiple positions). 40 hrs/wk; $53,000-$65,000/yr. Report/submit resume to Washington Job Ctr. Mgr., Millcraft Ctr., Ste. 150LL, 90 W. Chestnut St., Washington, PA 15301, web 95491

Programmer Analyst (Unix Networking/Sys. Admin. & Sys. Prog.): Install, customize & fine tune performance of operating sys. on heterogeneous platforms. Achieve connectivity of workstations using networking technologies. Perform sys. configuration mgmt. for both h'dware & s'ware. Provide user support & network trouble-shooting services. Carry out performance tuning of application packages such as Relational Database Mgmt systems (RDBMS) under Unix operating system. Manage TCP/IP based services such as NFS, NIS, TFP, TELNET, etc. Perform network mgmt. using SNMP & related tools. Ensure fault tolerant printer services & back-up mgmt. procedures. Utilizing knowl. of installation of WAN connectivity w/ heterogeneous h'dware platforms using routers &/or gateways over leased & dedicated circuits. Using knowl. of internals on operating sys. for patching & coding device drivers & network progrm'g using IPX/X, TLI, Streams & SOCKETS. Req: Bachelors degree in comp. sci. - math/engr'g/sci./bus. commerce - (or equiv.) & 1 yr exp to job or as software engineer/systems analyst. Must have appropriate combination of skills as follows: 1 of A & 2 of B or 1 of D; or 1 of A & 2 of B & 2 of C; or 1 of A &2 of C & 2 of D as follows: A) Operating Sys: IBM AIX, HP-UX, Sun Solaris, DEC Open VMS/Ultrix, SCO Unix/ODT, USL Unix SVR4, UnixWare, B) LAN/WAN Connectivity/Networking Protocols: TCP/IP, IPX/SPX, NFS, Bridges, Routers, Gateways, X.2.5, X.400, ISDN, ATM; C) System/Network Prgm'g: Perl, Korn, Shell, C Shell, RCP, TLI, Streams, SOCKETS, API & toolkits, DDK, AWK, SED, LEX, YACC; D) Networking techs: Ethernet, Token Ring, FDDI; high mobility preferred (multiple positions). 40 hrs/wk; $53,000 - $65,000/yr. Report/submit resume to Sue Notarnicola, Supervisor, Uniontown CareerLink, 32 Iowa Street, Uniontown, PA 15401-3513, Web 96833.

International Marketing Manager

Burlington Massachusetts Software Manufacturer needs a International Product Manager to develop and implement effective direct and indirect marketing strategies and plans for company products on a global basis; research market conditions in international arenas to determine potential sales of Elcin's products; analyze plan implement and control systems to track leads; recruit customers to participate in beta-testing procedures and obtain feedback; work with production department to manage the timely preparation and launching of marketing campaigns to take advantage of new product releases; and incorporate marketing devices into products and packaging; identify and develop leads through marketing programs and provide marketing and product knowledge to the partner sales team; establish research methodology and design formats for international market research, such as surveys, opinion polls or questionnaires; manage all Elcin activities related to the research, design and implementation of strategic marketing plans for our software products overseas; determine optimal channels of international distribution and pricing levels.

Applicants much have Bachelors Degree. Three years experience as Product Marketing Manager Knowledge of French. Experience in Internet Risk Management Product Management. 2-3 years experience in international markets, particularly England 3 years experience in high-tech marketing. Must have proof of legal authority to work in the U.S. $65,000 (40 hours per week) Send 2 resumes to: Case #19992474, PO Box #3968 Boston, MA 02114

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For Melbourne, FL employment. 3 openings available. Software system engineering for the design & implementation of a real generation railroad dispatch system. Responsibilities include systems & software engineering tasks. Systems engineering tasks consist of: system analysis, including customer interface system design; specification generation; use case development; system traceability development; & development of a unified model for train dispatching systems. Software engineering tasks consist of: software requirements analysis; architecture implementation; software analysis/design (including scenario, interaction, sequence & state diagrams); & implementation of a train dispatching system. Work closely with the customer & software engineers in developing & tracking system & subsystem level requirements; developing & maintaining internal & external interface control documents; & verifying that all requirements have been tested successfully. Requirements: Bachelor's degree in Computer Science or Electrical Engineering, 3 years work exp. in applying C++ & OOA/OOD techniques to the development of large scale software systems, including Unix platform, managing & planning the complete software lifecycle, including conducting requirements analysis & use case generation, & the domain of railroad operations, strategic software outsourcing & subcontract management. 40 hrs/wk. 8:00 a.m. to 5:00 p.m. $65,000-$70,000/year. No OT pay. To apply mail resume w/copy of ad to Kirk Stansbury, GE Harris Railway Electronics, 1990 Nasa Blvd., Melbourne, FL 32901. EEOE.

Programmer Analyst (Multiple Openings): Plans, develops, tests, and documents computer programs. Converts project specifications, using flowcharts and diagrams, into sequence of detailed instructions and logical steps for coding into computer language. Analyzes, reviews, and alters program to increase operating efficiency or adapt to new requirements using mainframe computer systems and related software. Work involves extensive travel and frequent relocation. Must have experience using: 1 of Group A and 1 or Group B and 1 of Group C, OR 2 of A and 1 of B, OR 2 of A and 1 of C as follows: Group A - DB2 ISM/3090 IBM ES/9000 MVS IMS, IOMS; Group B - CL/400 CICS, TSO, VSAM; Group C - TELON COBOL, JCL, AS/400 RPG/400 COBOL/400. Bachelor's degree in one or several listed fields: Computer Sci/Applic. Eng., Chem, Math or Physics. Salary is $60,000 per/yr, 40 hrs/wk, 8:00-5:00 p.m. Please submit resumes to Ms. Mary Pat Curran, Supervisor, McKeesport/Allegheny Co. CareerLink, 345 Fifth Avenue, McKeesport, PA 15132-2600. Reference Job Order No. WEB 103618.

Windows NT Security Software Engineer

to design, code & implement internet security software using multi-threaded & concurrent programming methodologies, network & internet programming techniques & internet & networking protocols. Required: Bachelor's or foreign deg equiv in Computer Sc., IT or EE with 2 yrs exp as Windows NT Security Software Engineer or 2 years software design & development experience must include 2 yrs of C or C++ system and security-based programming, Windows NT development & TCP/IP network programming. Must have implemented a TCP/IP network service or daemon. Respond to Ms. Margaret Prausee, Internet Security Systems, Inc., 6500 Peachtree Dunwoody Rd., N.E., 300 Embassy Row, Suite 500, Atlanta, Georgia 30328

SOFTWARE ENGINEER to design, develop, test, implement and maintain e-commerce application software using object-oriented programming and UML design tools. Oracle, SQL Server, MS Access, Java ASP, SQL and C++ for internet/intranet environments. Require: M.S. degree in Computer Science/Engineering, or a closely related field, with one year experience in the job offered or as a Programmer/Analyst. Experience gained before or after earning the M.S. degree will be accepted. Will be accepted. Extensive travel on assignments to various client sites within U.S. Salary: $66,000/year; 8 am to 5 pm M-F. Send resume to: Saumen K. Dutta, President, Cosec Corporation, 3945 Holcomb Bridge Road, Suite 300, Norcross, GA. Attn: Job MV

Programmer Analyst (Unix Networking/Sys. Admin. & Sys. Prog.): Install, customize & fine tune performance of operating sys. on heterogeneous platforms. Achieve connectivity of workstations using networking technologies. Perform sys. configuration mgmt. for both h'dware & s'ware. Provide user support & network trouble-shooting services. Carry out performance tuning of application packages such as Relational Database Mgmt systems (RDBMS) under Unix operating system. Manage TCP/IP based services such as NFS, NIS, TFP, TELNET, etc. Perform network mgmt. using SNMP & related tools. Ensure fault tolerant printer services & back-up mgmt. procedures. Utilizing knowl. of installation of WAN connectivity w/ heterogeneous h'dware platforms using routers &/or gateways over leased & dedicated circuits. Using knowl. of internals on operating sys. for patching & coding device drivers & network progrm'g using IPX/X, TLI, Streams & SOCKETS. Req: Bachelors degree in comp. sci. - math/engr'g/sci./bus. commerce - (or equiv.) & 1 yr exp to job or as software engineer/systems analyst. Must have appropriate combination of skills as follows: 1 of A & 2 of B or 1 of D; or 1 of A & 2 of B & 2 of C; or 1 of A &2 of C & 2 of D as follows: A) Operating Sys: IBM AIX, HP-UX, Sun Solaris, DEC Open VMS/Ultrix, SCO Unix/ODT, USL Unix SVR4, UnixWare, B) LAN/WAN Connectivity/Networking Protocols: TCP/IP, IPX/SPX, NFS, Bridges, Routers, Gateways, X.2.5, X.400, ISDN, ATM; C) System/Network Prgm'g: Perl, Korn, Shell, C Shell, RCP, TLI, Streams, SOCKETS, API & toolkits, DDK, AWK, SED, LEX, YACC; D) Networking techs: Ethernet, Token Ring, FDDI; high mobility preferred (multiple positions). 40 hrs/wk; $53,000 - $65,000/yr. Report/submit resume to Sue Notarnicola, Supervisor, Uniontown CareerLink, 32 Iowa Street, Uniontown, PA 15401-3513, Web 96833.

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Applicants must have a bachelor's degree in the natural sciences or a related field. This forty hour-per week position is located in Overland Park, Kansas. The salary is $68,400 per year. Applicants must have proof of legal authority to work in the United States.

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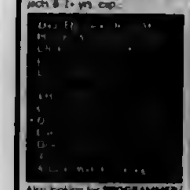
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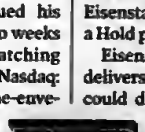
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Microsoft's Stock Outlook Uncertain

Analysts divided over ruling's effect on investors

BY PIMM FOX

AFTER JUDGE Thomas Penfield Jackson issued his antitrust ruling two weeks ago, analysts watching Microsoft Corp. [Nasdaq: MSFT] began their back-of-the-envelope calculations of what the behavioral remedies and a breakup would do to the company's stock — but they don't agree on the results.



The antitrust litigation has forced Wall Street to re-evaluate what it means to own Microsoft. "This is still a company with great technology and great talent," says Melissa Eisenstat, who covers Microsoft at CIBC World Markets in New York. But Eisenstat says she also believes "Microsoft is in catch-up mode with respect to emerging technology."

The emergence of wireless and Internet markets — and Microsoft's relatively low profile in them — means "Microsoft isn't going to be the leader they could have been three years ago," says Eisenstat, who downgraded the stock to a Hold prior to the judge's final ruling.

Eisenstat said if the appellate court delivers a mixed ruling, the process could drag on for months, weakening the stock's value. A ruling in favor of Microsoft would obviously lift the stock dramatically, and if it wins on appeal, there would be little impact unless the Supreme Court agrees to hear the case. Right now, behavioral remedies — which include orders that Microsoft share more Windows application programming interfaces, provide Windows without a browser and create standard pricing for Windows — have dampened investor enthusiasm, analysts said.

Thomas Weisel Partners LLC in San Francisco warns, "The bust-up as proposed by the Department of Justice and endorsed in its entirety by Judge Jackson will destroy shareholder value because it puts new, extreme restrictions on the operating system company."

Were Microsoft cut in two, Prudential Securities Inc. in New York reckons the combined stock price of the two severed divisions would be about $110 per share. However, Thomas Weisel Partners pegs the combined value of the two stocks at $50 to $55 per share. These divergent views, the result of varying analyses of ongoing business prospects for each division, can make Microsoft a confusing investment — something Wall Street tends to shun. ◗

Downward Trend

Microsoft stock weekly closing price:



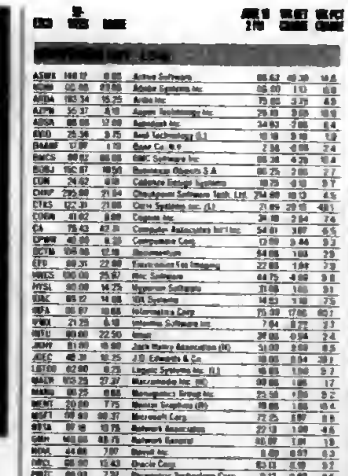
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Nov. 19: Judge Jackson releases his findings of fact, which claim Microsoft used its power in an anticompetitive fashion.

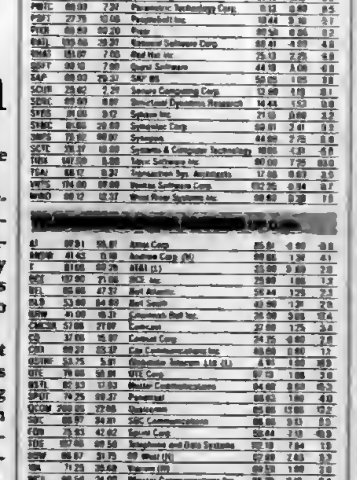
April 1: Mediation efforts fail.

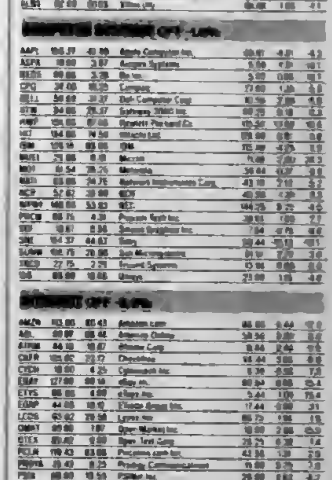
April 3: Jackson releases his conclusions, which find Microsoft violated the Sherman Antitrust Act.

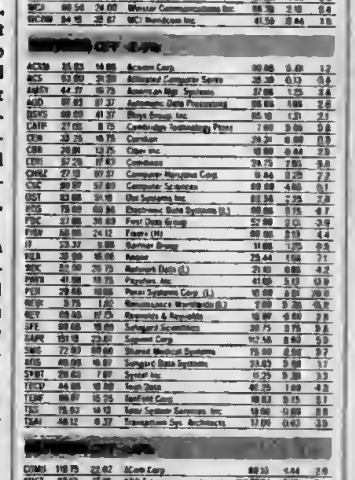
June 7: Jackson announces his decision to break Microsoft into two parts.





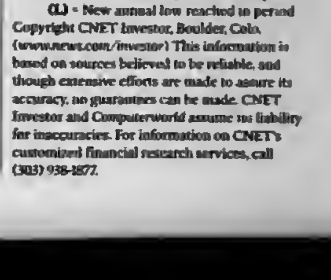












KEY: (H) = New annual high reached in period
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U.K. Post Can Make Paper Mail Disappear

It offers to open mail, send it electronically

BY LINDA ROSENCRANCE

IMAGINE never having to open a paper envelope again.

If you were a corporate customer of the Royal Mail, the U.K. postal service, you wouldn't have to. You can have the post open your paper mail and deliver it to you electronically.

Deployed on a full-scale basis last month and serving some 20 customers, the Physical to Electronic (PTE) mail service lets businesses have their regular mail — anything from general correspondence to application forms, customer surveys and purchase orders — go directly into their computer systems via the Internet or dedicated networks.

How popular the service will be is unclear; several U.S. users contacted about it declined to comment. One actually laughed.

But the Royal Mail claims that its service of opening companies' mail has adequate security and privacy safeguards to make it an attractive service for U.K. businesses and a revenue source for itself. In fact, postal services in Germany and other countries are looking at developing similar systems, according to officials at ActionPoint Inc. in San Jose, the company providing the software for Royal Mail.

Benefits include a lower cost to process mail because it arrives in file formats compatible with a company's computer systems, said Robin Speight, the Royal Mail's PTE project manager. In addition, companies that use the service should be able to "respond more quickly to customers and trading partners," Speight said.

Donald Broughton, an analyst at A. G. Edwards & Sons Inc. in St. Louis, said Royal Mail's process is really no different from what U.S. companies do with data they feed into a data warehouse. But, he added, customers need to be savvy.

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Companies have to sign an agreement giving the Royal



Mail permission to open their mail, said Speight, because tampering with mail is illegal in the U.K.

After mail is scanned, the paper is either delivered to the customer, destroyed in a secure environment or physically stored on-site, depending on the wishes of the company.

Continued from page 1

Java Standards

uct line manager for J2EE at Sun. "We want to work out the business differences with IBM and are extending an olive branch." Saletta said Sun wants to invite IBM back to the negotiating table to work out a licensing deal.

Bill Roth, group product marketing manager for J2EE at Sun, said he was "struck by this complete reversal" in IBM's stance but added, "We're happy to see the flip-flop. It shows us that this is a solvable problem."

For months, IBM has been cautious not to endorse Sun's J2EE specification, while simultaneously pledging to support the technical aspects of J2EE. IBM refused to use the J2EE brand name, and the company's name didn't appear with the 19 other J2EE licensees released by Sun at the JavaOne conference in San Francisco earlier this month.

User Chuck Grindel, a software engineer at Navimedix Inc. in Boston, said that IBM's breaking ranks with Sun on J2EE kept IBM's WebSphere off of the list of Java application servers that Navimedix was considering. Navimedix is an online health insurance claims processing services company.

No Straying, Please

"I would prefer that IBM stay with the fold on Java, because it gives the process a great deal of credibility because they are the biggest legacy system provider and have a lot of investments in the Java language and platform," said Grindel. "When and if IBM realizes that it cannot go out on its own, it would open up the possibility of our using their products. But it's difficult to make that decision if they are not supporting J2EE. There is safety in numbers."

WebSphere customer Roy Wiltse, project manager at nuclear power utility Edison International Inc. in Rosemead, Calif., called the J2EE licensing issue between IBM and Sun a "hassle" that needed to be resolved.

"We originally went with IBM because they were very standards-oriented," Wiltse said. "We want to be able to move from one platform to another or from one server to another vendor and still maintain most of the code that we've written."

Analysts said IBM, a staunch Java partisan for the past five years, sought to wrestle some control of Java from Sun by delaying its endorsement, but the strategy backfired.

"I've been fielding calls from IBM's customers asking me what their strategy is all week," said Mark Driver, an analyst at Gartner Group Inc. in Stamford, Conn. "IBM hurt themselves by coming out too strongly against the J2EE brand, which led to the false impression that they were backing away from Java."

IBM's Hebner cautioned, though, that the point of contention with Sun concerns marketing and not technical Java development issues.

Continued from page 1

H-1B Visas

ing. Meanwhile, he's making plans to start a division of his company — an Internet exchange for construction equipment users launched by Franksville, Wis.-based Riggers Manufacturing — in southern India. Though the Internet allows him to work halfway around the world, he will have limitations, such as not being able to attend important meetings or make some customer visits.

A severe backlog at the Immigration and Naturalization Service (INS) has forced people to wait three or more years to obtain green cards, even though the INS issued only about half the 140,000 employment-based visas it could have last year [News, June 5]. (Workers who have reached a certain stage in the approval process but haven't yet received their green cards can stay in the country with the necessary documentation.)

Chinese and Indian nationals who hold H-1B visas often wait the full six years without getting their green cards because they make up such a large number of H-1B holders — almost 60% last year. U.S. immigration is restricted by per-country ceilings. Meanwhile, Indian and Chinese workers started almost 3,000 companies and created almost 60,000 jobs in 1998, according to a University of California study.

INS spokeswoman Eyleen Schmidt said the agency doesn't have adequate resources to handle the 300% volume increase in visa applications since 1992. Typically, any budget raises are used to crack down on illegal immigration, she said.

"It's easier to take on competition in the Internet market than the INS," said Murali Devarakonda, a senior consultant at ShaktiSoft Inc., an e-commerce consulting firm in Fremont, Calif. The firm has sponsored his green card while he works on starting an Internet services company. His H-1B visa expires in November.

The INS reserves 10,000 visas for individuals who have invested at least $1 million in a new enterprise that will create at least 10 jobs over the next two years. But these visas are rarely granted, because the money must belong to the individual, not to venture capitalists, according to Liz Stern, an immigration attorney at Shaw Pittman in Washington.

Even Linux developer Linus Torvalds has been waiting for nearly three years for his green card.

In some cases, foreign high-tech workers have spouses in the same position, so they risk separation for a year or more.

Sunil Bhatia, a senior systems specialist at The Gap Inc. in San Bruno, Calif. — who hired about half a dozen people last year — has seven months left on his H-1B visa. But his wife, a software engineer at Nortel Networks Corp., has less than two months before her H-1B visa expires.

One solution they're exploring is to have both employers transfer them to either the U.K. or Canada. But the logistics are challenging. Both companies have operations in each country but in different cities.

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ABC ABP

U.K. Post Can Make Paper Mail Disappear

It offers to open mail, send it electronically

BY LINDA ROSENCRANCE

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Basic Services of Royal Mail's PTE

Workflow: Processing and electronic delivery of mail

Forms data capture: Data processing of structured and complex forms

Back file: Conversion of already-filed physical documents to electronic files that can be archived and stored for later retrieval

Undelivered mail, or goneaways: Management of undeliverable mail and updating of customer's database

Continued from page 1

H-1B Visas

ing. Meanwhile, he's making plans to start a division of his company — an Internet exchange for construction equipment users launched by Franksville, Wis.-based Riggers Manufacturing — in southern India. Though the Internet allows him to work halfway around the world, he will have limitations, such as not being able to attend important meetings or make some customer visits.

A severe backlog at the Immigration and Naturalization Service (INS) has forced people to wait three or more years to obtain green cards, even though the INS issued only about half the 140,000 employment-based visas it could have last year [News, June 5]. (Workers who have reached a certain stage in the approval process but haven't yet received their green cards can stay in the country with the necessary documentation.)

Chinese and Indian nationals who hold H-1B visas often wait the full six years without getting their green cards because they make up such a large number of H-1B holders — almost 60% last year. U.S. immigration is restricted by per-country ceilings. Meanwhile, Indian and Chinese workers started almost 3,000 companies and created almost 60,000 jobs in 1998, according to a University of California study.

INS spokeswoman Eyleen Schmidt said the agency doesn't have adequate resources to handle the 300% volume increase in visa applications since 1992. Typically, any budget raises are used to crack down on illegal immigration, she said.

"It's easier to take on competition in the Internet market than the INS," said Murali Devarakonda, a senior consultant at ShaktiSoft Inc., an e-commerce consulting firm in Fremont, Calif. The firm has sponsored his green card while he works on starting an Internet services company. His H-1B visa expires in November.

The INS reserves 10,000 visas for individuals who have invested at least $1 million in a new enterprise that will create at least 10 jobs over the next two years. But these visas are rarely granted, because the money must belong to the individual, not to venture capitalists, according to Liz Stern, an immigration attorney at Shaw Pittman in Washington.

Even Linux developer Linus Torvalds has been waiting for nearly three years for his green card.

In some cases, foreign high-tech workers have spouses in the same position, so they risk separation for a year or more.

Sunil Bhatia, a senior systems specialist at The Gap Inc. in San Bruno, Calif. — who hired about half a dozen people last year — has seven months left on his H-1B visa. But his wife, a software engineer at Nortel Networks Corp., has less than two months before her H-1B visa expires.

One solution they're exploring is to have both employers transfer them to either the U.K. or Canada. But the logistics are challenging. Both companies have operations in each country but in different cities. ▶

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Java Standards

uct line manager for J2EE at Sun. "We want to work out the business differences with IBM and are extending an olive branch." Saletta said. Sun wants to invite IBM back to the negotiating table to work out a licensing deal.

Bill Roth, group product marketing manager for J2EE at Sun, said he was "struck by this complete reversal" in IBM's stance but added, "We're happy to see the flip-flop. It shows us that this is a solvable problem."

For months, IBM has been cautious not to endorse Sun's J2EE specification, while simultaneously pledging to support the technical aspects of J2EE. IBM refused to use the J2EE brand name, and the company's name didn't appear with the 19 other J2EE licensees released by Sun at the JavaOne conference in San Francisco earlier this month.

User Chuck Grindel, a software engineer at Navimedix Inc. in Boston, said that IBM's breaking ranks with Sun on J2EE kept IBM's WebSphere off of the list of Java application servers that Navimedix was considering. Navimedix is an online health insurance claims processing services company.

No Straying, Please

"I would prefer that IBM stay with the fold on Java, because it gives the process a great deal of credibility because they are the biggest legacy system provider and have a lot of investments in the Java language and platform," said Grindel. "When and if IBM realizes that it cannot go out on its own, it would open up the possibility of our using their products. But it's difficult to make that decision if they are not supporting J2EE. There is safety in numbers."

WebSphere customer Roy Wiltse, project manager at nuclear power utility Edison International Inc. in Rosemead, Calif., called the J2EE licensing issue between IBM and Sun a "hassle" that needed to be resolved.

"We originally went with IBM because they were very standards-oriented," Wiltse said. "We want to be able to move from one platform to another or from one server to another vendor and still maintain most of the code that we've written."

Analysts said IBM, a staunch Java partisan for the past five years, sought to wrestle some control of Java from Sun by delaying its endorsement, but the strategy backfired.

"I've been fielding calls from IBM's customers asking me what their strategy is all week," said Mark Driver, an analyst at Gartner Group Inc. in Stamford, Conn. "IBM hurt themselves by coming out too strongly against the J2EE brand, which led to the false impression that they were backing away from Java."

IBM's Hebner cautioned, though, that the point of contention with Sun concerns marketing and not technical Java development issues. ▶

ABC ABP

FRANK HAYES/FRANKLY SPEAKING

Back to the farm

WHY EXACTLY *do* we keep our IT people in cubicle farms instead of spreading them out among users? Four weeks ago, I asked that question. And boy, did you respond. "As a former IT director, I took every opportunity to get my people working directly with end users," writes one reader, who's now a consultant. "I wanted them to live with the other people in the company so they could understand the problems firsthand, and work toward a real-world solution (which often, by the way, involved very little actual software development)."

But he ran into two kinds of opposition. "Senior operating executives opposed the idea, claiming loss of accountability and loss of control," he says. "And the IT staff liked having a home, their own social group, and valued the interaction with their technology peers. More than a couple of weeks at a stretch of working out of the department caused anxiety and stress."

The problem isn't just missing a chance to shoot the breeze with other tech geeks, as a Fortune 100 IT director points out: "The programmers working in user departments are geographically isolated from other programmers. This leads to a decrease in communication, and loss in sharing of common, reusable code, exchanging of new ideas and 'skunk works' efforts.

"And once you place the people in user departments, they're not into ideas such as cross-team projects, rotation or shared resources," he adds.

Another reader points out that when people leave, it's harder for colleagues to pick up the slack if they're scattered throughout the organization.

Which doesn't mean it's a bad idea to get IT people out of the cube farm, at least temporarily. "When I started my career 21 years ago, the VP of DP had an edict that each new programmer would spend at least two weeks working in the user area that his/her group supported," writes an IS auditor. "Nothing I experienced before or thereafter was more humbling, more eye-opening and more useful than getting a heavy dose of real-world end-user experience!"

And even if IT people aren't permanently stationed in userville, he says, the best software products came from developers who teamed with the most knowledgeable users — and had face-to-face interaction on practically a daily basis.

And what about the dollars-and-cents costs of all that face time with users? "Yes, putting developers in the user area for a period costs money in lost development time, and causes a slowdown of user processing because a new person is learning the business," the auditor says. "But the paybacks that follow make the investment up front *very* well worth it."

So, to recap: Most IT people should be in the cube farm at least some of the time, so they don't feel isolated or miss out on the chance to exchange ideas and build team spirit — or disappear from their managers' radar. But at least some of the time they need to be living with users, too.

Making the best use of your IT people is complex.



And how do you figure out who should be where, and when? If you trust your people, that one may be easy, says another reader: "The workers involved probably know with whom they need to be co-located to be most effective, and it would be wisdom for management to ask them."

Simple? No. Simple is keeping 'em all down on the farm, all the time. Making the best use of your IT people is complex. What users, equipment and the business need will define where each IT worker should be, when and for how long.

On the farm or with users? There are good reasons for them to be in either place.

Just make sure you know why. ◗

Hayes, Computerworld's staff columnist, has covered IT for more than 20 years. His e-mail address is frank_hayes@computerworld.com.

SHARK TANK

EEEEE-MAIL I An insurance company's IS administrator hits the hallways, visiting each department personally to notify this Tankster and other Microsoft Outlook users to exit the program so IT consultants can do some maintenance. They do, the work gets done, and the administrator sends everyone the all-clear – via e-mail.

EEEEE-MAIL II Another insurance company uses a mainframe-based e-mail system that is, to put it kindly, lame: It's internal only, it can't accept attachments, it doesn't notify users of new mail and it's painfully clumsy to use. "Not too many people bothered using the system," a pilot fish says. But for two years, the senior IT VP has resisted installing cc:Mail, even though his own e-mail project team recommends it. "His reason?" says the fish. "Since no one was using the current mainframe e-mail system, there obviously wasn't any real need for a *new* e-mail system!"

SAY CHEESY New exec is gung-ho on a company intranet. Roll it out, do it up brown, he urges. But one day he's concerned because the IT shop's digital camera is missing from its usual berth. Where is it? This pilot fish explains it's down in human resources so they can photograph new employees and post their pics on the intranet. Get the camera back, the boss says – he wants to take it on his two-week family vacation.

AFTER THREE DAYS of waiting for IS to set up his workstation, this new contractor pilot fish finally gets the standard setup. Then the IS tech asks, "Will he need Web access?" Fish and his boss look at each other and guffaw. "Only if he wants to work," says the boss. "He's the webmaster." The chuckles stop as the tech trots off to get approval from her boss. It takes the rest of the day – "with me standing around drinking coffee," grumbles the fish – to get the machine online.

PRODUCTIVITY This programmer pilot fish spends an hour sitting in his small office, staring at the wall as he visualizes his program flow. Meanwhile, across the accounting department bullpen, the CFO complains to the company president, "I've been doing nothing for an hour but watching that programmer, and he hasn't done anything!"

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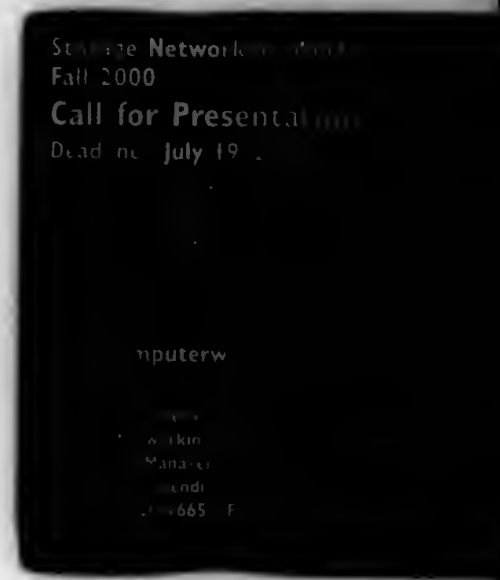
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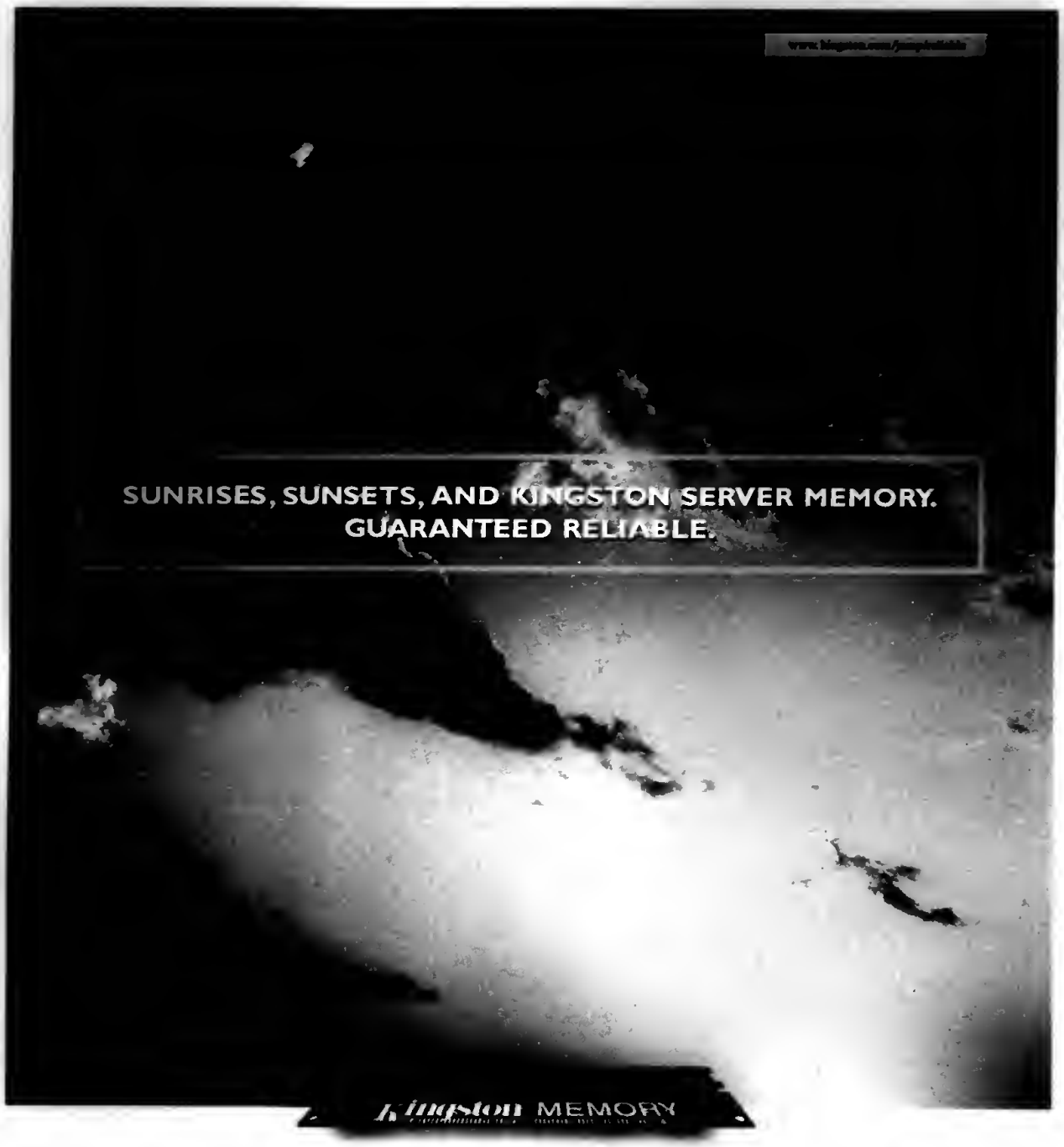
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